

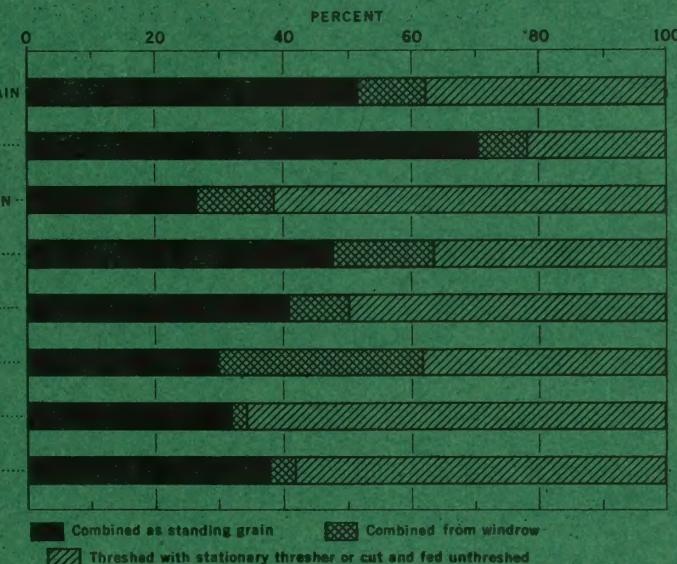
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UNITED STATES DEPARTMENT OF AGRICULTURE
BUREAU OF AGRICULTURAL ECONOMICS

HARVESTING
SMALL GRAINS
and
UTILIZATION
OF THE STRAW

SMALL GRAINS: ACREAGE HARVESTED BY SPECIFIED METHODS,
UNITED STATES, 1945



U. S. DEPARTMENT OF AGRICULTURE

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The basic information of this report was furnished by the voluntary crop reporters of the United States Department of Agriculture in February 1946. Farmers from all parts of the United States reported on the methods of harvesting wheat, oats, barley, rye, flax, and buckwheat, and on the utilization of the straw. The reports are judgment estimates of the proportion of the acreage of each crop, in the locality, harvested by specified methods and the percentage of the straw utilized in various ways.

About 13,000 reports were obtained concerning the harvesting methods used with oats and the utilization of its straw. All States were covered in the oat study.

About 11,700 reports were obtained concerning the practices used in harvesting wheat and utilization of wheat straw. All States harvesting more than 1,000 acres of wheat were covered in the study except Wisconsin and Maine. More than 99 percent of the harvested wheat acreage and production in 1945 was in the reporting States.

Information concerning barley harvesting practices and the utilization of its straw was obtained from about 6,000 crop correspondents in 38 States, which contributed about 98 percent of the 1945 harvested barley acreage and production.

For flaxseed, about 900 reports were received from correspondents in 6 States which in 1945 had about 85 percent of the harvested acreage and about 90 percent of the production.

For rye, about 1,200 reports were supplied by crop correspondents from 5 States with about 50 percent of the 1945 harvested rye acreage and about 55 percent of the 1945 production.

For buckwheat, reports were received from about 300 crop correspondents in New York, and Michigan, which had about 30 percent of the 1945 United States acreage and production.

This report also contains estimates of grain harvesting methods and straw utilization for States not covered by reports from crop correspondents. In most instances the estimates are for States where small acreages of the crop were grown. These estimates were developed largely from reports supplied by crop correspondents in adjacent or nearby States. It was assumed that the method of harvest and the utilization of straw of a specific small-grain crop in a non-reporting State would show about the same relationship to harvesting practices and straw utilization of another small-grain crop reported in that State as was indicated in an adjoining or nearby State which reported on both of those crops.

The information concerning harvesting methods for rice and utilization of the straw was obtained mostly from rice specialists and others familiar with practices in the various rice States. The inclusion of these estimates permits a fairly close appraisal of the harvest methods and straw utilization of all small-grain crops.

This report contains estimates of harvesting practices for the 1938 wheat and oat crops based chiefly on material supplied by crop correspondents in February 1939, and estimates of custom harvest rates based on information supplied by crop correspondents for the 1938 and 1945 small-grain crops.

The data for harvesting wheat and oats in 1938 are included in order to provide a direct measure of the changes in harvesting practices for wheat and oats and the changes in custom harvest rates that occurred from 1938 to 1945.

HARVESTING SMALL GRAINS AND UTILIZATION OF THE STRAW

By A. P. Brodell, Agricultural Economist, J. W. Birkhead, Agricultural Economist, and J. H. Peters, Agricultural Statistician

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INTRODUCTION

The harvested area of all small-grain crops in 1945 was about 125 million acres. This was about 11 percent above the 1935-44 average and was exceeded only by the harvested acreage of 1919. With relatively favorable growing conditions, per acre yields of the major small grains in 1945 were above average. Abandonment of seeded acreage was low, and this accounted in part for the large harvested acreage. With average abandonment the harvested acreage in 1945 would have been only 4 percent above average.

The harvested acreage of all small-grain crops in 1945 amounted to about 35 percent of the acreage of all harvested crops, and exceeded the harvested acreage of corn, the leading crop, by more than 40 percent.

Labor used per acre for growing and harvesting small-grain crops is materially below the average for all crops. This is mainly because

the small-grain crops are extensively grown on relatively large farms in the more level areas where large power units and machines are used. Production of wheat, the leading small-grain crop, has long been mechanized more than any other major crop. Even so, it has been further mechanized within recent years and there has been a marked increase in mechanization in both growing and harvesting other small grains of late when farmers had bountiful grain crops.

The farm labor force was depleted during the war with a relatively high proportion being children, women, and elderly male workers. Wage rates were much higher, compared with prewar rates, than was the cost of doing work by machine methods. These have hastened the use of labor-saving machines of all types, especially those used during the busy harvest season. Farmers' cash incomes have been much higher than before the war so they could buy new machines and adopt new methods.

HARVESTING SMALL GRAINS

Combining is now the most important method of harvesting small grains. About 125 million acres of small grains were harvested in 1945 of which about 62 percent was combined (table 1). About 52 percent of the total acreage was combined as standing grain and about 10 percent was combined from the windrow. Windrow combining accounted for more than 20 percent of the harvested small-grain acreage in North Dakota, South Dakota, Iowa, and Minnesota and is relatively important in Illinois. About 90 percent of the total acreage of small grains was combined as standing grain or from the windrow in California, Washington, Oregon, and Kansas. Combines harvested approximately 27 percent of the small-grain acreage in the Lake States but in the Great Plains States where small grain production is important about two-thirds of the acreage was combined.

About 58 percent of the 1945 acreage of small grains was threshed with stationary threshers or cut and fed unthreshed. About 75 percent of the small grain in the Lake States and two-thirds of that in the Appalachian and Northeastern States was so handled.

Wheat

The 1945 harvested wheat crop of about 65.1 million acres was exceeded in 1919, 1938 and 1946. The 1945 production of about 1.1 billion bushels was only slightly below the record crop of 1946. The 1945 yield per harvested acre of 17.0 bushels has been exceeded only in 1942, 1944, and 1946.

Table 1.- Percentage of small-grain crops harvested by specified methods 1/

| State | Total acres harvested | | | Percentage of 1945 acreage that was: | | |
|----------------|-----------------------|-------------|-------------|---|------------|-----------------------|
| | | | | Combined | | |
| | 1935-39 | 1940-44 | 1945 | As standing | From grain | Threshed with windrow |
| | average | average | 1945 | | | |
| | 1,000 acres | 1,000 acres | 1,000 acres | Percent | Percent | Percent |
| New England | 209 | 182 | 151 | 22.3 | .1 | 77.6 |
| New York | 1,418 | 1,355 | 1,219 | 38.5 | .2 | 61.3 |
| New Jersey | 128 | 158 | 126 | 83.4 | .1 | 16.5 |
| Pennsylvania | 2,163 | 2,005 | 1,990 | 32.7 | .2 | 67.1 |
| Delaware | 89 | 84 | 101 | 63.7 | .1 | 36.2 |
| Maryland | 526 | 468 | 494 | 33.5 | -- | 66.5 |
| Northeast | 4,533 | 4,252 | 4,081 | 36.5 | .2 | 63.3 |
| Ohio | 3,498 | 3,142 | 3,358 | 64.3 | 1.0 | 34.7 |
| Indiana | 3,332 | 2,762 | 3,060 | 67.4 | 3.2 | 29.4 |
| Illinois | 5,959 | 4,882 | 4,806 | 55.2 | 15.8 | 29.0 |
| Iowa | 6,880 | 5,699 | 5,559 | 18.7 | 22.1 | 59.2 |
| Missouri | 4,211 | 3,394 | 2,931 | 39.4 | 2.1 | 58.5 |
| Corn Belt | 23,880 | 19,879 | 19,714 | 46.0 | 11.0 | 43.0 |
| Michigan | 2,526 | 2,409 | 2,693 | 54.5 | 1.6 | 43.9 |
| Wisconsin | 3,700 | 3,130 | 3,258 | 13.1 | 1.1 | 85.8 |
| Minnesota | 9,420 | 8,677 | 8,158 | 2.2 | 20.4 | 77.4 |
| Lake States | 15,646 | 14,216 | 14,109 | 14.7 | 12.3 | 73.0 |
| North Dakota | 10,681 | 14,306 | 16,439 | 24.4 | 36.5 | 39.1 |
| South Dakota | 6,029 | 7,974 | 8,732 | 13.6 | 29.5 | 56.9 |
| Nebraska | 6,461 | 6,463 | 7,008 | 52.1 | 3.5 | 44.4 |
| Kansas | 12,911 | 13,576 | 14,970 | 91.8 | .6 | 7.6 |
| Great Plains | 36,082 | 42,321 | 47,149 | 47.9 | 18.9 | 33.2 |
| West Virginia | 256 | 197 | 180 | 3.2 | -- | 96.8 |
| Kentucky | 579 | 568 | 556 | 37.1 | -- | 62.9 |
| Tennessee | 619 | 643 | 750 | 36.7 | -- | 63.3 |
| Appalachian | 1,454 | 1,408 | 1,486 | 32.8 | -- | 67.2 |
| Virginia | 800 | 751 | 742 | 25.7 | -- | 74.3 |
| North Carolina | 797 | 833 | 858 | 57.3 | -- | 42.7 |
| South Carolina | 673 | 895 | 956 | 44.4 | -- | 55.6 |
| Georgia | 618 | 755 | 897 | 45.2 | -- | 54.8 |
| Florida | 10 | 15 | 45 | 52.0 | -- | 48.0 |
| Alabama | 114 | 202 | 274 | 44.7 | -- | 55.3 |
| Southeast | 3,012 | 3,451 | 3,772 | 44.0 | -- | 56.0 |
| Mississippi | 87 | 314 | 504 | 67.1 | -- | 32.9 |
| Louisiana | 531 | 674 | 714 | 29.8 | -- | 70.2 |
| Arkansas | 474 | 557 | 633 | 24.8 | -- | 75.2 |
| Delta States | 1,092 | 1,545 | 1,851 | 38.2 | -- | 61.8 |
| Oklahoma | 5,974 | 6,009 | 7,287 | 81.8 | -- | 18.2 |
| Texas | 4,844 | 5,103 | 7,919 | 82.4 | -- | 17.6 |
| Oklahoma-Texas | 10,818 | 11,112 | 15,206 | 82.1 | -- | 17.9 |
| Montana | 3,660 | 4,770 | 5,109 | 80.8 | 3.0 | 16.2 |
| Idaho | 1,388 | 1,440 | 1,585 | 67.5 | .9 | 31.6 |
| Wyoming | 381 | 460 | 530 | 53.6 | 2.9 | 43.5 |
| Colorado | 1,569 | 2,157 | 2,574 | 63.4 | 1.3 | 35.3 |
| New Mexico | 266 | 301 | 379 | 81.5 | .3 | 18.2 |
| Arizona | 86 | 106 | 131 | 88.0 | 1.9 | 10.1 |
| Utah | 373 | 434 | 469 | 50.3 | .1 | 49.6 |
| Nevada | 31 | 45 | 49 | 85.7 | -- | 14.3 |
| Mountain | 7,754 | 9,713 | 10,826 | 72.2 | 2.0 | 25.8 |
| Washington | 2,412 | 2,511 | 2,814 | 90.0 | .2 | 9.8 |
| Oregon | 1,396 | 1,397 | 1,484 | 89.4 | 1.5 | 9.1 |
| California | 2,361 | 2,478 | 2,570 | 93.0 | 5.2 | 1.8 |
| Pacific | 6,169 | 6,386 | 6,868 | 91.0 | 2.4 | 6.6 |
| United States | 110,440 | 114,283 | 125,062 | 51.7 | 10.6 | 37.7 |

1/ Includes wheat, oats, barley, rye, flaxseed, buckwheat, and rice.

Production of wheat has long been highly mechanized. There were more combines in 1945 than ever before and a higher percentage of the crop was undoubtedly combined than ever before. Combines were used for harvesting wheat before the turn of the 20th century, but for years the combine method made little headway. Probably only 5 percent of the acreage was combine harvested in 1920. Before World War I, practically no combines were used except in California and the Pacific Northwest. They were drawn by big teams and wheel traction was used as a source of power for operating the thresher-separator unit. Relatively small tractor-drawn combines, equipped with auxiliary motors, were gradually developed and were introduced in the wheat areas of the Mountain and Plains States during World War I.

The introduction of the small combine in the early 30's was mainly responsible for the use of combines in the Corn Belt, the Northeast, and the more humid southern areas where small-grain acreages per farm are usually limited. Soybeans for grain are usually harvested with the combine and with the marked expansion of acreage in the war years, many farmers in the Corn Belt bought combines primarily for soybeans and these combines were available for the small grain harvest.

In 1938, about 49 percent of the country's wheat acreage was combine-harvested (table 2). Since 1938, use of the combine has increased in all parts of the country, and in 1945 about 78 percent of the acreage was harvested with combines. About 70 percent of the 1945 acreage was combined as standing grain and about 8 percent was combined from the windrow.

For information by counties see figure 1, which shows that in most counties of the Southern and Central Plains States, in California, the Palouse area, and in some counties of the Corn Belt, the Mountain and Southeast States, 90 percent or more of the 1945 harvested wheat acreage was combined either as standing grain or from the windrow. The combine method has made little progress in many counties of the Appalachian and Lake States, and in the Ozarks.

Information by counties concerning windrow combining of wheat is found in figure 2. Harvesting wheat by combining from the windrow is confined mainly to the spring wheat counties of the Great Plains and Lake States and some of the Northern counties of the Western and Central Corn Belt States. It was most important in the Red River Valley counties of North Dakota. Windrow-combining is usually done in areas in which the crop ripens unevenly and where there are many weeds. Rainfall during the harvest season increases somewhat the quantity of grain combined from the windrow.

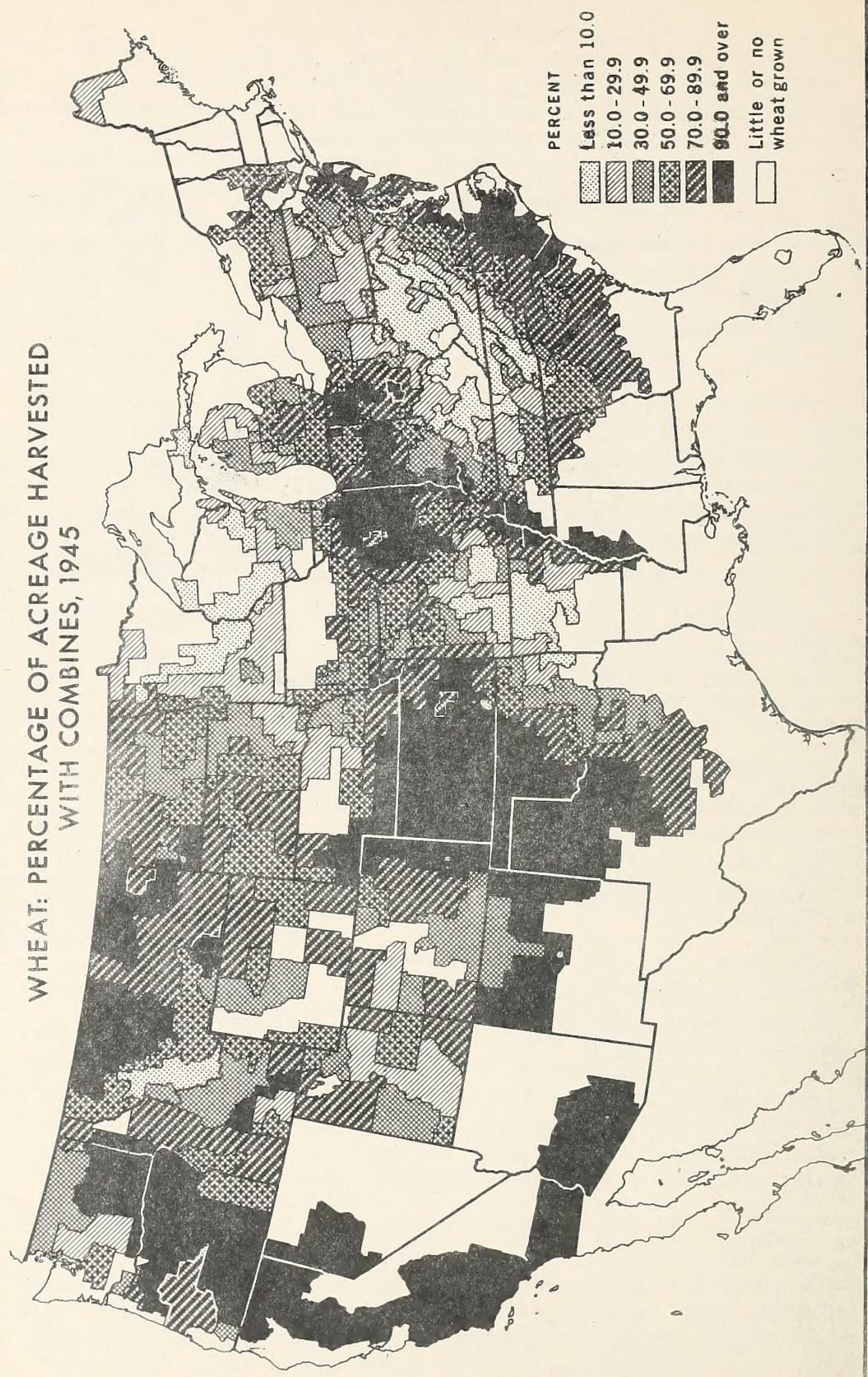
Stationary threshers were used for more than half of the wheat in the Appalachian States, the Northeastern States, and the Lake States. In areas of the West where the demand for straw is above average, they continue to be fairly important. Most of the wheat threshed with them is cut with binders, although some in the Appalachian and Southern States is still cut with cradles.

Table 2.- Wheat harvested by specified methods, by States and State groups, 1938 and 1945

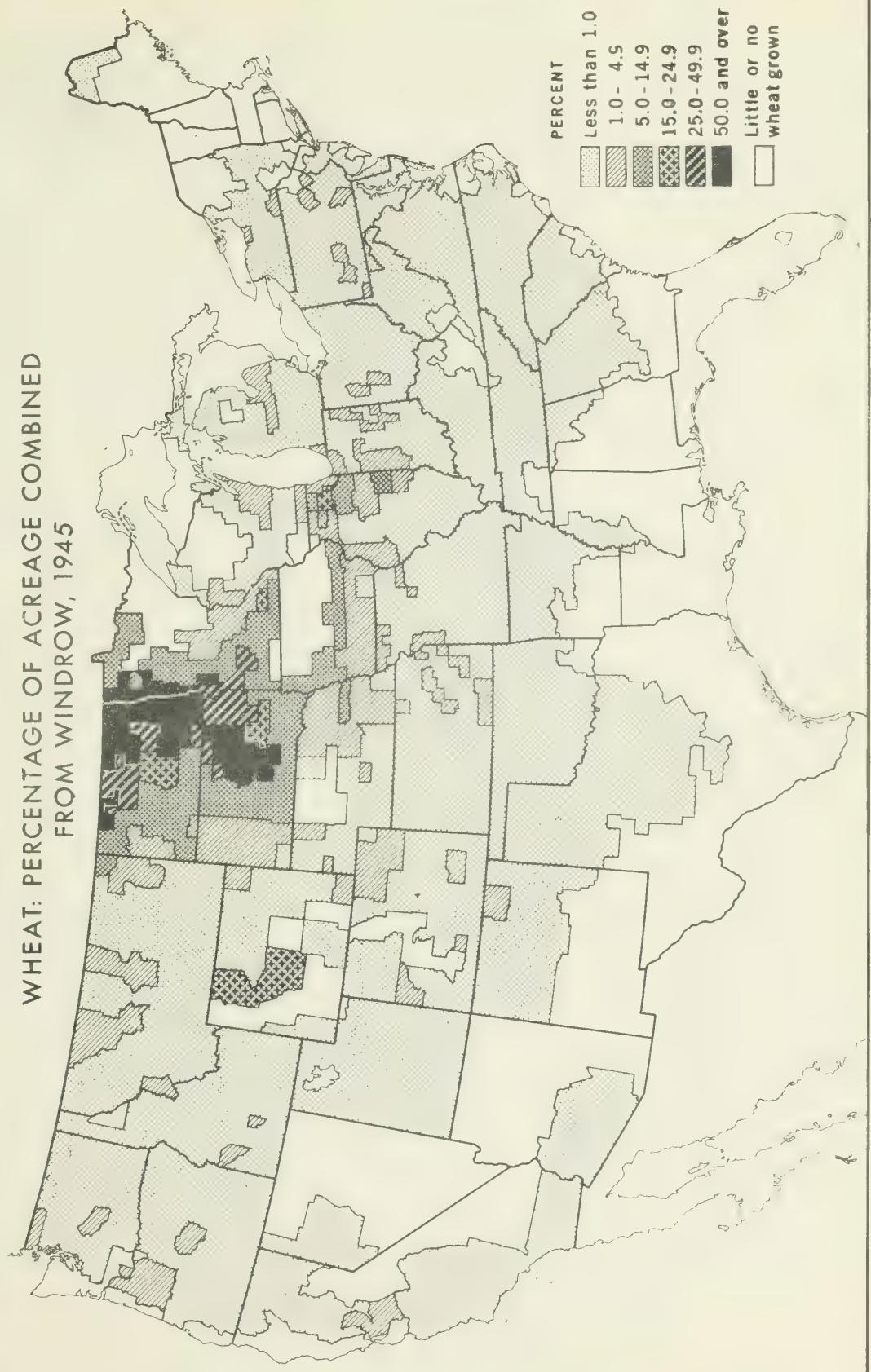
| State | Percentage of 1938 acreage that was: | | | | Percentage of 1945 acreage that was: | | | |
|----------------|--------------------------------------|------------------------|--------------------------|------------------------------|--------------------------------------|----------|-------------|--|
| | Acres harvested in 1938 | Harvested with binders | Harvested by all methods | Harvested with other binders | Acres harvested in 1945 | Combined | As standing | Threshed with windrow or cut and grain fed |
| | 1,000 acres | Percent | Percent | Percent | 1,000 acres | Percent | Percent | Percent |
| | 3 | 1 | 1 | 1 | 1 | 25.0 | - | 75.0 |
| | 302 | 11 | 87 | 2 | 346 | 47.9 | .1 | 52.0 |
| | 61 | 24 | 73 | 3 | 63 | 86.9 | .1 | 13.0 |
| | 1,019 | 6 | 92 | 2 | 932 | 34.8 | .2 | 65.0 |
| Maine | | | | | | | | |
| New York | | | | | | | | |
| New Jersey | | | | | | | | |
| Pennsylvania | | | | | | | | |
| Delaware | | | | | | | | |
| Maryland | | | | | | | | |
| Northeast | 1,922 | 3/ 6 | 3/ 91 | 3/ 5 | 1,775 | 40.2 | .1 | 59.7 |
| Ohio | 2,379 | 22 | 77 | 1 | 2,129 | 65.6 | .4 | 34.0 |
| Indiana | 1,769 | 30 | 69 | 1 | 1,555 | 73.0 | 1.0 | 26.0 |
| Illinois | 2,212 | 44 | 55 | 1 | 1,339 | 80.0 | 1.0 | 19.0 |
| Iowa | 583 | 28 | 72 | 4/ | 140 | 47.0 | 10.0 | 43.0 |
| Missouri | 2,499 | 22 | 76 | 2 | 1,304 | 51.0 | 1.0 | 48.0 |
| Corn Belt | 9,442 | 29 | 70 | 1 | 6,467 | 67.0 | 1.0 | 32.0 |
| Michigan | 910 | 16 | 84 | 4/ | 982 | 62.0 | 1.0 | 37.0 |
| Wisconsin | 120 | 3 | 96 | 1 | 60 | 2/ 19.0 | 2/ 1.0 | 2/ 80.0 |
| Minnesota | 2,554 | 6 | 94 | 4/ | 1,100 | 2.0 | 26.0 | 72.0 |
| Lake States | 3,584 | 8 | 92 | 4/ | 2,142 | 30.0 | 13.9 | 56.1 |
| North Dakota | 8,082 | 23 | 70 | 7 | 9,855 | 31.0 | 35.0 | 34.0 |
| South Dakota | 3,095 | 19 | 71 | 10 | 3,201 | 26.0 | 33.0 | 41.0 |
| Nebraska | 4,691 | 51 | 48 | 1 | 3,596 | 77.0 | 2.0 | 21.0 |
| Kansas | 14,494 | 82 | 16 | 2 | 13,416 | 95.6 | .4 | 4.0 |
| Great Plains | 30,362 | 55 | 42 | 3 | 30,068 | 64.8 | 15.4 | 19.8 |
| West Virginia | 135 | 1 | 58 | 41 | 87 | 4.0 | - | 96.0 |
| Kentucky | 552 | 8 | 85 | 7 | 371 | 43.0 | - | 57.0 |
| Tennessee | 486 | 6 | 85 | 9 | 364 | 37.0 | - | 63.0 |
| Appalachian | 1,173 | 6 | 82 | 12 | 822 | 36.3 | - | 63.7 |
| Virginia | 590 | 3 | 83 | 14 | 490 | 29.0 | - | 71.0 |
| North Carolina | 480 | 11 | 67 | 22 | 408 | 69.0 | - | 31.0 |
| South Carolina | 161 | 8 | 62 | 30 | 205 | 74.0 | - | 26.0 |
| Georgia | 165 | 11 | 45 | 44 | 183 | 71.0 | - | 29.0 |
| Alabama | 5 | 22 | 35 | 43 | 21 | 74.0 | - | 26.0 |
| Southeast | 1,401 | 7 | 71 | 22 | 1,307 | 55.2 | - | 44.8 |
| Mississippi | - | - | - | - | 18 | 90.0 | - | 10.0 |
| Arkansas | 66 | 12 | 68 | 20 | 39 | 50.0 | - | 50.0 |
| Delta States | 66 | 12 | 68 | 20 | 57 | 62.0 | - | 38.0 |
| Oklahoma | 5,607 | 70 | 28 | 2 | 5,910 | 91.0 | - | 9.0 |
| Texas | 3,894 | 82 | 18 | 4/ | 5,350 | 93.0 | - | 7.0 |
| Oklahoma-Texas | 9,501 | 75 | 24 | 1 | 11,260 | 92.0 | - | 8.0 |
| Montana | 4,249 | 55 | 40 | 5 | 3,777 | 85.0 | 2.0 | 13.0 |
| Idaho | 1,169 | 40 | 57 | 3 | 1,102 | 69.0 | 1.0 | 30.0 |
| Wyoming | 257 | 32 | 60 | 8 | 232 | 65.0 | 2.0 | 33.0 |
| Colorado | 1,273 | 44 | 41 | 15 | 1,483 | 70.0 | 1.0 | 29.0 |
| New Mexico | 258 | 5/ 80 | 5/ 15 | 5/ 5 | 297 | 90.0 | .1 | 9.9 |
| Arizona | 50 | 93 | 7 | 4/ | 24 | 95.0 | - | 5.0 |
| Utah | 293 | 41 | 56 | 3 | 279 | 55.0 | - | 45.0 |
| Nevada | 22 | 63 | 24 | 13 | 20 | 92.0 | - | 8.0 |
| Mountain | 7,571 | 50 | 44 | 6 | 7,214 | 77.9 | 1.5 | 20.6 |
| Washington | 2,257 | 83 | 14 | 3 | 2,524 | 92.8 | .2 | 7.0 |
| Oregon | 1,068 | 78 | 21 | 1 | 921 | 93.2 | .8 | 6.0 |
| California | 850 | 95 | 4 | 1 | 563 | 98.4 | .6 | 1.0 |
| Pacific | 4,175 | 84 | 14 | 2 | 4,008 | 93.7 | .4 | 5.9 |
| United States | 69,197 | 3/ 49 | 3/ 47 | 3/ 4 | 65,120 | 70.6 | 7.8 | 21.6 |

1/ No information obtained. 2/ No reports received from crop correspondents. Estimates based largely on reports supplied in adjacent or nearby States. 3/ Average for States reporting. 4/ Less than one-half of 1 percent. 5/ Figures revised from those originally published in "Farm Labor Report," July 1939.

WHEAT: PERCENTAGE OF ACREAGE HARVESTED
WITH COMBINES, 1945



WHEAT: PERCENTAGE OF ACREAGE COMBINED
FROM WINDROW, 1945



U. S. DEPARTMENT OF AGRICULTURE

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FIGURE 2

Oats for Grain

With a record yield of 36.6 bushels per harvested acre, and with a harvested acreage only about 8 percent below the record of 1921, the 1945 oat crop of 1,536 million bushels was our largest to date. The introduction of new high-yielding varieties has placed oats in an improved competitive position with other crops. Both acreage and production have increased, especially in the Great Plains, the Delta States, and the Southeastern States.

For the country as a whole, the combine method has not made great headway in the harvesting of oats. More than 61 percent of the 1945 acreage was threshed with stationary threshers or was cut and fed unthreshed (table 3). Cutting ripe oats and feeding them unthreshed is done fairly extensively in the Delta States, the Southeastern States, some Northeastern States, and in local areas in the Western States. Little of this is done in the Corn Belt, the Lake States, and the Great Plains where most of the oat crop is grown.

About 38 percent of the 1945 acreage of oats was harvested with combines, while in 1938 only 10 percent of the acreage was combined. In that year only 9 States reported harvesting 20 percent or more of the oats harvested for grain with combines; in 1945, in 16 States, more than half the acreage was combined. In most areas, oat straw for feed and for bedding is preferred to the straw of other small grains. When the straw is saved, the combine and the binder-thresher use about the same labor. Oats often ripen less evenly and are more subject to stem breakage after ripening than most other major small-grain crops and some varieties are likely to shatter considerably if left standing until fully ripe. Also new rust-resistant varieties of oats often ripen the grain while the straw is partially green. These factors influence the method of harvesting and are partly responsible for the low percentage harvested as standing grain with the combine.

Almost one-third of the acreage of oats harvested with combines was windrow-combined, whereas only about 10 percent of the wheat acreage harvested with combines was from the windrow. Combining from the windrow was most important in North Dakota, South Dakota, Minnesota, Iowa, and Illinois. It was fairly important in Nebraska, Indiana, Oregon and California. It was reported on a small scale in some other States. No information was obtained from crop correspondents in the Southern States concerning combining from the windrow but it is believed that little if any is done there. More than 65 percent of the 1945 harvested acreage of oats in the Lake States, the Great Plains, the Northeastern States, and the Appalachian States was threshed with stationary threshers or cut and fed unthreshed. In most counties of California and in some counties in Oregon, Texas, and in the Corn Belt States, 90 percent or more of the 1945 oat crop was combined (fig. 3).

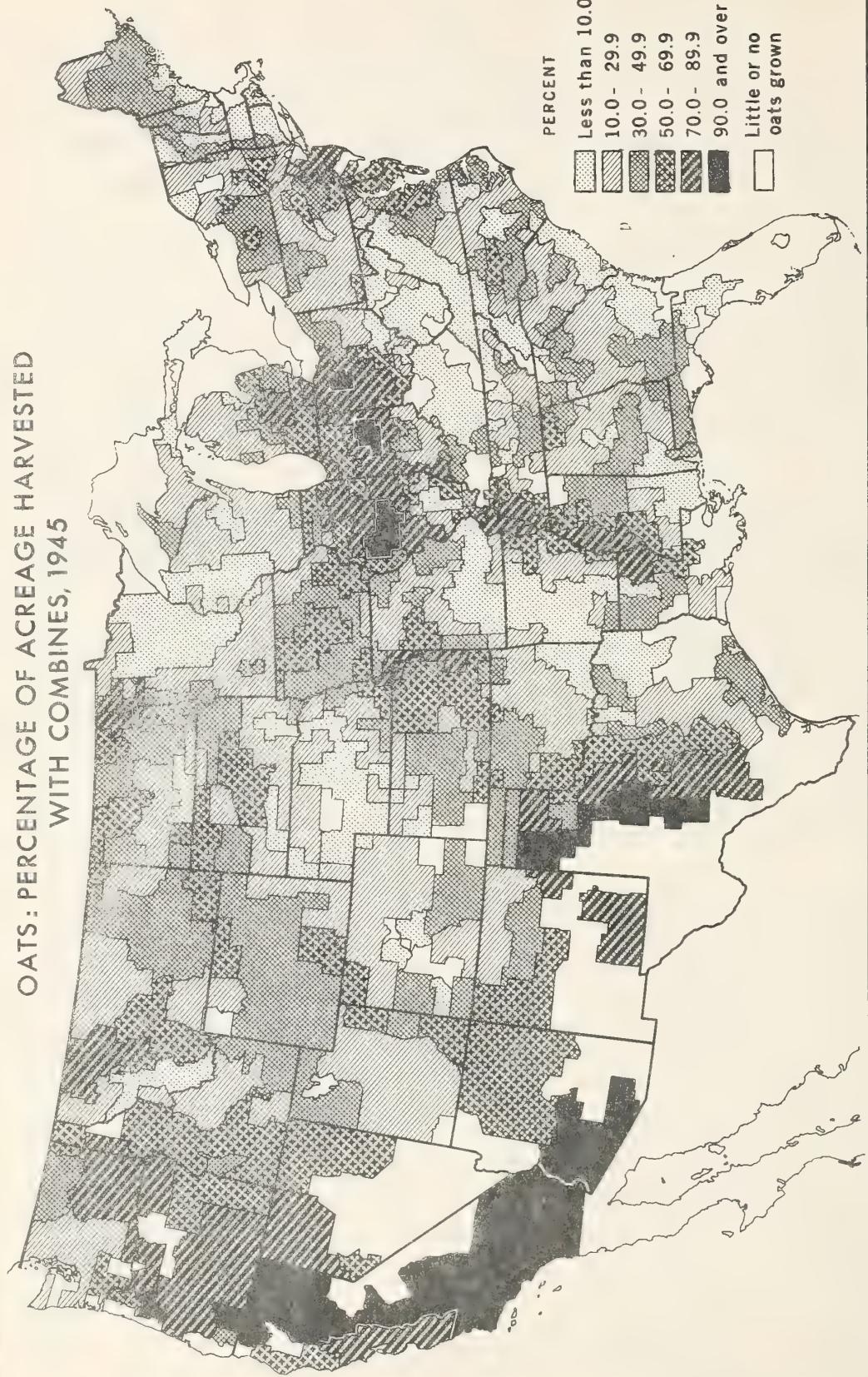
Table 3.- Oats harvested by specified methods by States and State groups, 1938 and 1945

| State | Acres | Percentage of 1938 acreage that was: | | | Acres | Percentage of 1945 acreage that was: | | |
|----------------|-------------|--------------------------------------|--------------------------------|----------------------|--------------------------------|--------------------------------------|----------------------------|----------------------------|
| | harvested | Combined | Harvested by all grain in 1938 | Harvested by binders | Harvested by all grain in 1945 | Combined | Harvested by grain in 1945 | Harvested by grain in 1945 |
| | 1,000 acres | Percent | Percent | Percent | 1,000 acres | Percent | Percent | Percent |
| New England | 174 | 1/ | 1/ | 1/ | 137 | 21.9 | .1 | 78.0 |
| New York | 798 | 5 | 86 | 9 | 663 | 30.0 | .2 | 69.8 |
| New Jersey | 46 | 18 | 70 | 12 | 42 | 77.0 | .2 | 22.8 |
| Pennsylvania | 870 | 4 | 91 | 5 | 806 | 30.0 | .2 | 69.8 |
| Delaware | 2 | 5 | 93 | - | 5 | 60.0 | - | 40.0 |
| Maryland | 35 | 2 | 92 | 6 | 37 | 19.0 | .2 | 80.8 |
| Northeast | 1,925 | 2/ 5 | 2/ 88 | 2/ 7 | 1,690 | 30.4 | .2 | 69.4 |
| Ohio | 1,121 | 14 | 85 | 1 | 1,162 | 62.0 | 2.0 | 36.0 |
| Indiana | 1,310 | 20 | 78 | 2 | 1,371 | 61.0 | 6.0 | 33.0 |
| Illinois | 3,591 | 22 | 77 | 1 | 3,372 | 45.0 | 22.0 | 33.0 |
| Iowa | 5,972 | 8 | 91 | 1 | 5,323 | 18.0 | 22.0 | 60.0 |
| Missouri | 1,855 | 9 | 82 | 9 | 1,511 | 29.0 | 3.0 | 68.0 |
| Corn Belt | 13,849 | 13 | 85 | 2 | 12,739 | 35.1 | 16.2 | 48.7 |
| Michigan | 1,261 | 9 | 89 | 2 | 1,505 | 50.0 | 2.0 | 48.0 |
| Wisconsin | 2,455 | 3 | 95 | 2 | 2,987 | 13.0 | 1.0 | 86.0 |
| Minnesota | 3,900 | 3 | 96 | 1 | 5,392 | 2.0 | 17.0 | 81.0 |
| Lake States | 7,616 | 4 | 95 | 1 | 9,884 | 12.6 | 9.9 | 77.5 |
| North Dakota | 1,390 | 6 | 89 | 5 | 2,653 | 7.0 | 35.0 | 58.0 |
| South Dakota | 1,564 | 2 | 96 | 2 | 3,497 | 4.0 | 24.0 | 72.0 |
| Nebraska | 1,797 | 6 | 92 | 2 | 2,439 | 19.0 | 6.0 | 75.0 |
| Kansas | 1,471 | 18 | 80 | 2 | 968 | 47.0 | 2.0 | 51.0 |
| Great Plains | 6,222 | 8 | 89 | 3 | 9,577 | 13.0 | 20.2 | 66.8 |
| West Virginia | 86 | 2 | 35 | 63 | 72 | 2.0 | - | 98.0 |
| Kentucky | 70 | 3 | 62 | 35 | 88 | 15.0 | - | 85.0 |
| Tennessee | 85 | 5 | 71 | 24 | 245 | 30.0 | - | 70.0 |
| Appalachian | 241 | 3 | 56 | 41 | 405 | 21.7 | - | 78.3 |
| Virginia | 105 | 4 | 60 | 36 | 142 | 14.0 | - | 86.0 |
| North Carolina | 242 | 12 | 44 | 44 | 375 | 44.0 | - | 56.0 |
| South Carolina | 491 | 7 | 53 | 40 | 714 | 35.0 | - | 65.0 |
| Georgia | 440 | 7 | 41 | 52 | 695 | 38.0 | - | 62.0 |
| Florida | 10 | 1/ | 1/ | 1/ | 45 | 52.0 | - | 48.0 |
| Alabama | 112 | 10 | 18 | 72 | 251 | 42.0 | - | 58.0 |
| Southeast | 1,400 | 2/ 8 | 2/ 43 | 2/ 47 | 2,222 | 37.3 | - | 62.7 |
| Mississippi | 104 | 23 | 19 | 58 | 480 | 66.0 | - | 34.0 |
| Louisiana | 57 | 26 | 22 | 52 | 131 | 60.0 | - | 40.0 |
| Arkansas | 218 | 4 | 41 | 55 | 304 | 35.0 | - | 65.0 |
| Delta States | 379 | 13 | 32 | 55 | 915 | 54.8 | - | 45.2 |
| Oklahoma | 1,463 | 10 | 84 | 6 | 1,104 | 32.0 | .2 | 67.8 |
| Texas | 1,618 | 18 | 73 | 9 | 1,837 | 55.0 | - | 45.0 |
| Oklahoma-Texas | 3,081 | 14 | 78 | 8 | 2,941 | 46.4 | .1 | 53.5 |
| Montana | 298 | 10 | 81 | 9 | 323 | 44.0 | 3.0 | 53.0 |
| Idaho | 149 | 25 | 73 | 2 | 171 | 54.0 | 1.0 | 45.0 |
| Wyoming | 124 | 7 | 80 | 13 | 164 | 35.0 | 4.0 | 61.0 |
| Colorado | 163 | 7 | 86 | 7 | 220 | 25.0 | 1.0 | 74.0 |
| New Mexico | 30 | 15 | 74 | 11 | 43 | 40.0 | - | 60.0 |
| Arizona | 7 | 22 | 78 | - | 12 | 65.0 | - | 35.0 |
| Utah | 37 | 6 | 94 | - | 50 | 33.0 | - | 67.0 |
| Nevada | 4 | 47 | 53 | - | 9 | 80.0 | - | 20.0 |
| Mountain | 812 | 12 | 81 | 7 | 992 | 39.9 | 2.0 | 58.1 |
| Washington | 148 | 35 | 59 | 6 | 150 | 53.0 | 1.0 | 46.0 |
| Oregon | 241 | 37 | 61 | 2 | 273 | 75.0 | 5.0 | 20.0 |
| California | 128 | 1/ | 1/ | 1/ | 165 | 83.0 | 7.0 | 10.0 |
| Pacific | 517 | 2/ 36 | 2/ 60 | 2/ 4 | 588 | 71.6 | 4.6 | 23.8 |
| United States | 36,042 | 2/ 10 | 2/ 85 | 2/ 5 | 41,933 | 26.4 | 12.0 | 61.6 |

1/ No information obtained.

2/ Average of reporting States.

OATS: PERCENTAGE OF ACREAGE HARVESTED
WITH COMBINES, 1945



U. S. DEPARTMENT OF AGRICULTURE

NEG. 46323 BUREAU OF AGRICULTURAL ECONOMICS

FIGURE 3

Barley

The acreage of barley harvested in 1945 was the smallest since 1937, and about 17 percent below the 1935-44 average. The yield per harvested acre, however, was about the same as the high yields of 1941 and 1942 and the production was only about 8 percent below average. In recent years the reduction in barley acreage has been most pronounced in the Corn Belt, the Lake States, and in Nebraska and Kansas, but increases were reported in North Dakota and in most of the Mountain and Pacific Coast States (table 4). North Dakota, South Dakota, and California, the three leading barley-producing States, accounted for about two-thirds of the harvested acreage in 1945 but, owing to the relatively low yields in North Dakota and South Dakota, they contributed less than half of the total barley production in the United States.

About 64 percent of the 1945 crop was harvested with combines. About 48 percent was combined as standing grain and about 16 percent was combined from the windrow. In North Dakota, South Dakota, and Minnesota, where spring barley is grown, combining from the windrow took the lead. In North Dakota a larger percentage of the barley acreage was combined from the windrow than was true of oats or wheat; in South Dakota the percentage was larger than for wheat but slightly smaller than for oats. The principal reasons for the relatively high percentage in these States is the heavy concentration in areas where windrow-combining of small grains is generally followed and the tendency of some varieties of barley to shatter badly if left standing until fully ripe.

In Ohio and most of the Northeastern States a somewhat higher percentage of the barley acreage was combined than any other of the small grains.

In about one-third of the States, 50 percent or more of the barley was threshed with stationary threshers or cut and fed unthreshed.

Rye

Rye acreage has decreased so sharply in recent years that the 1.9 million acres harvested in 1945 was about 45 percent below the 1935-44 average, and except for 1946, was the smallest harvested acreage in more than 60 years. The 1945 yield per harvested acre was slightly above the 1935-44 average yield but the production of nearly 24 million bushels was about 43 percent below the average production of 1935-44.

Although some rye is harvested for grain in 35 States, about half of the 1945 harvested acreage was in 5 States--Nebraska, South Dakota, North Dakota, Minnesota, and Wisconsin. For the country as a whole about 41 percent of the acreage was combined as standing grain and 9 percent was combined from the windrow. About 50 percent was threshed with stationary threshers (table 5).

In Oklahoma-Texas, and the Pacific Coast States 80 percent or more of the acreage was harvested with combines. The percentage of rye so harvested in the Corn Belt was above the United States average.

In the Great Plains States only about half the acreage was harvested with combines and more than 75 percent in the Lake States was threshed with stationary threshers. Most of the acreage combined from the windrow was in North Dakota, South Dakota, and Minnesota.

Table 4.- Barley harvested by specified methods, by States and State groups, 1945 crop

| State | Total acres harvested | | | Percentage of 1945 acreage that was: | | |
|----------------|-----------------------|-------------|-------------|--------------------------------------|------------|--|
| | | | | Combined | | Threshed with |
| | 1935-39 | 1940-44 | 1945 | As standing | From grain | stationary thresher or windrow cut and fed |
| | average | average | average | Percent | Percent | Percent |
| | 1,000 acres | 1,000 acres | 1,000 acres | Percent | Percent | Percent |
| New England | 10 | 9 | 6 | 1/ 32.0 | — | 1/ 68.0 |
| New York | 146 | 110 | 102 | 1/ 56.8 | 1/ .2 | 1/ 43.0 |
| New Jersey | 3 | 8 | 8 | 94.9 | .1 | 5.0 |
| Pennsylvania | 72 | 131 | 102 | 39.8 | .2 | 60.0 |
| Delaware | 1 | 7 | 10 | 77.8 | .2 | 22.0 |
| Maryland | 43 | 76 | 65 | 29.9 | .1 | 70.0 |
| Northeast | 275 | 341 | 293 | 46.1 | .2 | 53.7 |
| Ohio | 20 | 40 | 23 | 80.0 | 1.0 | 19.0 |
| Indiana | 24 | 68 | 44 | 70.0 | 1.0 | 29.0 |
| Illinois | 109 | 109 | 31 | 74.0 | 5.0 | 21.0 |
| Iowa | 465 | 185 | 3 | 1/ 35.0 | 1/ 15.0 | 1/ 50.0 |
| Missouri | 123 | 152 | 66 | 43.0 | 1.0 | 56.0 |
| Corn Belt | 741 | 554 | 167 | 60.8 | 2.0 | 37.2 |
| Michigan | 196 | 185 | 118 | 1/ 52.0 | 1/ 2.0 | 1/ 46.0 |
| Wisconsin | 830 | 445 | 90 | 14.0 | 2.0 | 84.0 |
| Minnesota | 2,075 | 1,432 | 447 | 1.0 | 27.0 | 72.0 |
| Lake States | 3,101 | 2,062 | 655 | 12.0 | 19.0 | 69.0 |
| North Dakota | 1,404 | 2,218 | 2,284 | 10.0 | 45.0 | 45.0 |
| South Dakota | 1,411 | 1,916 | 1,299 | 11.0 | 29.0 | 60.0 |
| Nebraska | 745 | 1,520 | 610 | 45.0 | 3.0 | 52.0 |
| Kansas | 392 | 1,127 | 383 | 78.2 | 1.8 | 20.0 |
| Great Plains | 3,952 | 6,781 | 4,576 | 20.7 | 31.2 | 48.1 |
| West Virginia | 6 | 11 | 9 | 5.0 | — | 95.0 |
| Kentucky | 29 | 95 | 55 | 37.0 | — | 63.0 |
| Tennessee | 38 | 92 | 98 | 56.0 | — | 44.0 |
| Appalachian | 73 | 196 | 162 | 46.8 | — | 53.2 |
| Virginia | 52 | 77 | 68 | 26.0 | — | 74.0 |
| North Carolina | 11 | 36 | 40 | 71.0 | — | 29.0 |
| South Carolina | 4 | 10 | 21 | 67.0 | — | 33.0 |
| Georgia | — | 8 | 9 | 61.0 | — | 39.0 |
| Alabama | — | 3 | 2 | 81.0 | — | 19.0 |
| Southeast | 67 | 134 | 140 | 48.0 | — | 52.0 |
| Mississippi | — | 4 | 6 | 90.0 | — | 10.0 |
| Arkansas | 8 | 10 | 9 | 30.0 | — | 70.0 |
| Delta States | 8 | 14 | 15 | 54.0 | — | 46.0 |
| Oklahoma | 209 | 430 | 185 | 85.0 | — | 15.0 |
| Texas | 136 | 301 | 248 | 88.0 | — | 12.0 |
| Oklahoma-Texas | 345 | 731 | 433 | 86.7 | — | 13.3 |
| Montana | 124 | 380 | 672 | 77.0 | 4.0 | 19.0 |
| Idaho | 152 | 337 | 307 | 69.5 | .5 | 30.0 |
| Wyoming | 64 | 101 | 124 | 56.0 | 3.0 | 41.0 |
| Colorado | 409 | 638 | 791 | 61.0 | 2.0 | 37.0 |
| New Mexico | 10 | 25 | 34 | 63.0 | 2.0 | 35.0 |
| Arizona | 30 | 53 | 78 | 89.7 | .3 | 10.0 |
| Utah | 76 | 135 | 130 | 47.8 | .2 | 52.0 |
| Nevada | 10 | 21 | 20 | 82.0 | — | 18.0 |
| Mountain | 875 | 1,690 | 2,156 | 67.4 | 2.3 | 30.3 |
| Washington | 69 | 229 | 125 | 79.9 | .1 | 20.0 |
| Oregon | 137 | 250 | 257 | 92.5 | .5 | 7.0 |
| California | 1,173 | 1,302 | 1,486 | 97.0 | 2.0 | 1.0 |
| Pacific | 1,379 | 1,781 | 1,868 | 95.2 | 1.7 | 3.1 |
| United States | 10,816 | 14,284 | 10,465 | 47.9 | 15.7 | 36.4 |

1/ No reports received from crop correspondents. Estimates based largely on reports supplied in adjacent or nearby States.

Table 5.- Rye harvested by specified methods, by States and State groups, 1945 crop 1/

| State | Total acres harvested | | | Percentage of 1945 acreage that was: | | |
|----------------|-----------------------|-------------|-------------|---|-----------------------------|-------------|
| | | | | Combined | | |
| | 1935-39 | 1940-44 | 1945 | As standing | From thresher or windrow | cut and fed |
| | average | average | 1945 | grain | grain | grain |
| | | | | | | |
| | 1,000 acres | 1,000 acres | 1,000 acres | Percent | Percent | Percent |
| New York | 22 | 18 | 10 | 44.8 | .2 | 55.0 |
| New Jersey | 19 | 15 | 13 | 79.9 | .1 | 20.0 |
| Pennsylvania | 75 | 54 | 41 | 29.8 | .2 | 70.0 |
| Delaware | 7 | 12 | 19 | 66.8 | .2 | 33.0 |
| Maryland | 16 | 19 | 20 | 49.8 | .2 | 50.0 |
| Northeast | 139 | 118 | 103 | 48.2 | .2 | 51.6 |
| Ohio | 58 | 75 | 27 | 59.8 | .2 | 40.0 |
| Indiana | 139 | 118 | 70 | 70.0 | 1.0 | 29.0 |
| Illinois | 100 | 58 | 47 | 69.0 | 1.0 | 30.0 |
| Iowa | 120 | 19 | 11 | 36.0 | 7.0 | 57.0 |
| Missouri | 53 | 45 | 41 | 47.0 | 1.0 | 52.0 |
| Corn Belt | 470 | 311 | 196 | 61.7 | 1.2 | 37.1 |
| Michigan | 139 | 71 | 56 | 49.0 | 1.0 | 50.0 |
| Wisconsin | 282 | 134 | 95 | 12.0 | 1.0 | 87.0 |
| Minnesota | 484 | 215 | 107 | 3.0 | 14.0 | 83.0 |
| Lake States | 905 | 420 | 258 | 16.3 | 6.4 | 77.3 |
| North Dakota | 762 | 624 | 115 | 11.0 | 42.0 | 47.0 |
| South Dakota | 549 | 582 | 290 | 16.0 | 32.0 | 52.0 |
| Nebraska | 379 | 370 | 361 | 41.0 | 2.0 | 57.0 |
| Kansas | 66 | 99 | 81 | 79.0 | 1.0 | 20.0 |
| Great Plains | 1,756 | 1,675 | 847 | 32.0 | 17.6 | 50.4 |
| West Virginia | 9 | 4 | 4 | 5.0 | — | 97.0 |
| Kentucky | 14 | 25 | 40 | 33.0 | — | 67.0 |
| Tennessee | 38 | 41 | 34 | 35.0 | — | 65.0 |
| Appalachian | 61 | 68 | 78 | 32.3 | — | 67.7 |
| Virginia | 44 | 42 | 36 | 30.0 | — | 70.0 |
| North Carolina | 58 | 42 | 31 | 53.0 | — | 47.0 |
| South Carolina | 14 | 25 | 16 | 55.0 | — | 45.0 |
| Georgia | 21 | 22 | 10 | 60.0 | — | 40.0 |
| Southeast | 137 | 131 | 93 | 45.2 | — | 54.8 |
| Oklahoma | 56 | 131 | 74 | 82.0 | — | 18.0 |
| Texas | 8 | 22 | 21 | 85.0 | — | 17.0 |
| Oklahoma-Texas | 64 | 153 | 95 | 82.2 | — | 17.8 |
| Montana | 39 | 39 | 17 | 73.0 | 2.0 | 25.0 |
| Idaho | 7 | 7 | 5 | 64.0 | 1.0 | 35.0 |
| Wyoming | 18 | 21 | 8 | 66.0 | 1.0 | 33.0 |
| Colorado | 39 | 87 | 80 | 70.0 | 1.0 | 29.0 |
| New Mexico | 3 | 12 | 5 | 62.0 | 4.0 | 34.0 |
| Utah | 5 | 6 | 10 | 39.7 | .3 | 60.0 |
| Mountain | 109 | 172 | 125 | 67.2 | 1.2 | 31.6 |
| Washington | 16 | 25 | 15 | 67.0 | .2 | 32.8 |
| Oregon | 34 | 38 | 33 | 80.0 | .5 | 19.5 |
| California | 8 | 10 | 13 | 95.0 | .5 | 4.5 |
| Pacific | 58 | 73 | 61 | 80.0 | .4 | 19.6 |
| United States | 3,699 | 3,121 | 1,856 | 41.0 | 9.2 | 49.8 |

1/ Reports received from crop correspondents in Wisconsin, Minnesota, North Dakota, South Dakota, and Nebraska. Estimates in other areas based largely on harvest practices for other small grains for which reports were received.

Flaxseed

The outbreak of World War II reduced our imports of vegetable oils. This brought a great expansion in the acreage of flaxseed and other oil-producing crops. Both acreage and production of flaxseed in 1945 were the fourth largest of record, being exceeded only in 1902, 1942, and 1943. Although in 1945 both acreage and production were more than 40 percent above their 1935-44 averages, they were somewhat below the 1940-44 averages which were influenced by the large crops of 1942 and 1943.

Although flaxseed acreage was estimated in 1945 in 16 States, 4 States, Minnesota, North Dakota, South Dakota and Montana had about 90 percent of the harvested acreage and more than 85 percent of the production. For the country as a whole, 62 percent of the crop was threshed with combine harvester-threshers. As the bulk of the flaxseed is grown in parts of the Northern Great Plains and the Red River Valley, where combining from the windrow is relatively important, a higher proportion of the acreage of flaxseed was windrow-combined than was the case for any other small grain (table 6). Then, too flax is more subject to weed infestation than are other small grains.

Table 6.- Flaxseed harvested by specified methods, by States, 1945 crop

| State | Harvested acres 1/ | | | Percentage of 1945 acreage that was | | |
|------------------|--------------------|-----------|-----------|--|---------|------------|
| | Combined | | | Combined | | |
| | 1935-39 | 1940-44 | 1945 | as | from | with |
| | average | average | | standing | windrow | stationary |
| | | | | grain | | threshers |
| | Thousands | Thousands | Thousands | Percent | Percent | Percent |
| Iowa | 30 | 237 | 75 | 13.0 | 53.0 | 34.0 |
| Minnesota | 709 | 1,411 | 1,067 | 4.0 | 30.0 | 66.0 |
| North Dakota | 418 | 1,119 | 1,525 | 35.0 | 36.0 | 29.0 |
| South Dakota | 98 | 346 | 441 | 7.0 | 47.0 | 46.0 |
| Kansas | 61 | 191 | 122 | 2/ 78.0 | 2/ 10.0 | 2/ 12.0 |
| Texas | — | 26 | 63 | 2/ 98.0 | — | 2/ 2.0 |
| Montana | 41 | 270 | 320 | 2/ 76.0 | 2/ 13.0 | 2/ 11.0 |
| Arizona | 5 | 17 | 17 | 87.0 | 13.0 | — |
| California | 53 | 198 | 113 | 70.0 | 29.0 | 1.0 |
| All other States | 36 | 89 | 42 | 2/ 47.0 | 2/ 11.0 | 2/ 42.0 |
| United States | 1,451 | 3,904 | 3,785 | 29.8 | 32.0 | 38.2 |

1/ Does not include acreage of flax grown for fiber.

2/ No reports received from crop correspondents. Estimates based largely on reports supplied in adjacent or nearby States.

Buckwheat

Acreage and production of buckwheat have been declining for years. The 409 thousand acres of buckwheat harvested in 1945 was only about half as large as the acreage usually harvested around 1920 and slightly below the average of 1935-44.

Although in 1945 the acreage of buckwheat was estimated in 20 States, Pennsylvania and New York together had more than half of the harvested acreage and production. Farmers who grow buckwheat usually have only a few acres and the fields are rather hilly, so stationary threshers are still much used. Almost two-thirds of the 1945 acreage was threshed with them. Only about a third was combined, and that mostly as standing grain (table 7). A smaller percentage of the buckwheat acreage was combined than of any other small-grain crop.

Table 7.-- Acreage of buckwheat harvested by specified methods, by States, and State groups, 1945 crop 1/

| State | Harvested acres | | | Percentage of 1945 acreage that was | | |
|----------------------------|-----------------|-----------|-----------|-------------------------------------|----------|------------|
| | Combined | | | Threshed | | |
| | 1935-39 | 1940-44 | 1945 | as | Combined | with |
| | average | average | | standing | from | stationary |
| | | | | grain | windrow | threshers |
| | Thousands | Thousands | Thousands | Percent | Percent | Percent |
| New York | 138 | 138 | 98 | 43.0 | .2 | 56.8 |
| Pennsylvania | 130 | 124 | 109 | 29.0 | .1 | 70.9 |
| All other Northeast States | 18 | 14 | 15 | 18.9 | .1 | 81.0 |
| Northeast | 286 | 276 | 220 | 34.6 | .2 | 65.2 |
| Michigan | 25 | 30 | 25 | 65.0 | .1 | 34.9 |
| Wisconsin | 13 | 17 | 19 | 15.0 | .1 | 84.9 |
| Minnesota | 15 | 34 | 45 | 2.0 | 8.0 | 90.0 |
| Lake States | 53 | 81 | 89 | 22.5 | 4.1 | 73.4 |
| Corn Belt | 42 | 35 | 60 | 53.2 | .4 | 46.4 |
| Great Plains | 10 | 6 | 11 | 5.7 | 43.2 | 51.1 |
| Appalachian | 21 | 16 | 19 | 4.6 | -- | 95.4 |
| Southeast | 13 | 13 | 10 | 4.0 | -- | 96.0 |
| United States | 425 | 425 | 409 | 31.8 | 2.2 | 66.0 |

1/ Reports received from crop correspondents in New York and Michigan. Estimates in other areas based largely on harvest practices for other small grains for which reports were received.

Rice

Expansion in rice acreage has been rather pronounced. The 1945 harvested acreage was about 28 percent above the 1935-44 average, and only 5 percent below the record high of 1946. The yield per acre in 1945 was slightly below average, but the crop of more than 68 million bushels was the largest thus far produced.

Information obtained from rice specialists in rice-producing States and from published State reports show that about 42 percent of the 1945 acreage was combined, mostly as standing grain. In California, where combines have long been used for harvesting rice, about 97 percent of the acreage was combined, with an estimated one-fourth combined from the windrow. In the humid Eastern rice areas combines made little headway until mechanical dryers were installed, but an estimated 60 percent of the Texas acreage, 23 percent of the Louisiana acreage, and 10 percent of the Arkansas acreage was harvested with combines in 1945 (table 8).

Before mechanical dryers were developed much of the rice harvested with the combine was from the windrow, as rice combined as standing grain usually had too much moisture for successful storing. Mechanical dryers are also used for some rice threshed with stationary threshers. Combines especially designed for operating in rice fields together with the mechanical dryers, have furthered the combining of rice. Mechanical dryers have contributed to a marked improvement in the milling quality of rice. "Sun checking" is greatly reduced and this means higher mill yields of unbroken or head rice. The new combines are of the track type, are self-propelled, and can be operated to better advantage than standard pull-type combines in the rice fields which have "wet spots" and sometimes water-logged areas.

It was estimated that in 1945 mechanical dryers were used on about 24 percent of the Louisiana rice crop, about 75 percent of the California crop, and about 60 percent of the Texas crop. No estimate was obtained for Arkansas but it is believed that about the same percentage of the crop was dried as was harvested with the combine.

In 1945, stationary threshers were used to thresh about 58 percent of the total rice crop, with this method accounting for about 3 percent of the crop in California, 40 percent in Texas, 77 percent in Louisiana, and 90 percent in Arkansas. As combines and mechanical dryers are increasing, especially in the humid rice areas, it is believed that the proportion of the crop combined was considerably larger in 1946 than in 1945.

Table 8.- Rice harvested by specified methods, by States, 1945 crop

| State | Acres harvested | | | Percentage of 1945 acreage that was | | |
|---------------|-----------------|---------|----------|-------------------------------------|------------|----------|
| | 1935-39 | 1940-44 | 1945 | Combined | Combined | Threshed |
| | average | average | standing | from | stationary | |
| | | | grain | windrow | ary | thresher |
| Arkansas | 169 | 258 | 281 | 10.0 | — | 90.0 |
| Louisiana | 477 | 559 | 583 | 1/ 23.0 | -- | 1/ 77.0 |
| Texas | 254 | 349 | 400 | 60.0 | — | 40.0 |
| California | 123 | 188 | 230 | 72.0 | 25.0 | 3.0 |
| United States | 1,003 | 1,334 | 1,494 | 58.0 | 3.9 | 58.1 |

1/ Adapted from the August 1945 issue of the Louisiana Rural Economist.

Custom Harvest Rates

Farmers have used custom machines and cooperatively owned machines for the small-grain harvest for many years. Before combines were adopted extensively, most of the threshing of small grain was done by custom threshers or by machines owned by groups of farmers. Few farmers had enough acres of small grain to warrant owning a separator-thresher.

Now many farmers own and operate the combines that harvest their crops and they often harvest small grains for their neighbors.

With stationary thresher, custom rates are influenced by such factors as the proportion of the threshing crew furnished by the thresherman, the volume of production per farm, and the general wage level. In most instances, farmers deliver their unthreshed grain to the thresher and move the threshed

grain to farm storage or to market. The thresherman usually furnishes only the crew needed to operate the thresher-separator and power unit. In some localities the thresherman may furnish the workers and teams to bring the grain to the thresher but even then the farmer usually takes the grain away after it is threshed.

Custom harvest rates for threshing are usually on a per bushel basis and custom combine rates on a per acre basis, but in some areas—especially in the Southeastern States, the Appalachian States, and the Delta States—often a share of the crop is paid for threshing or for combining. In instances in which a share of the crop was paid, the money equivalent was calculated and used in this report. Where small acreages are threshed with stationary threshers, a specified fee per "set" is often charged in addition to the per bushel rate. When low-yielding grain is combined, more acres can usually be covered each day than when the yield is high; so to equalize somewhat the returns per hour of machine use, a custom operator may charge a "flat" fee per acre for a specified minimum yield, plus an additional charge per bushel for higher yields.

Along with the marked increase in the general level of farm costs there has been a marked increase in custom rates for harvesting small grain. Custom rates for combining wheat in 1945, for the entire country, averaged more than 90 percent above the 1938 rates, with the largest increases reported for the Pacific Coast and Mountain States. For oats, the increase in custom combine rates from 1938 to 1945 averaged only about 56 percent (table 9); the bulk of this crop is grown in the Corn Belt and in the Lake States where relatively small increases in custom rates were reported.

In most sections the per acre custom combine rate was slightly higher for wheat than for oats, in both 1938 and 1945. The increase in custom rates for threshing oats, from 1938 to 1945, averaged about 33 percent. Many threshing machines in the important oat-producing States are owned cooperatively by farmers; in such cases, the fee charged for threshing largely reflects expenses other than labor of operating the threshing machines.

In many localities the thresherman furnishes practically the entire threshing crew and this is reflected in the high custom-threshing rates of North Dakota, Texas and some other States.

The cost of new machines and parts increased from 1938 to 1945. The increase, however, was less than the increase in wage rates. The rates per bushel for threshing oats in both 1938 and 1945, were below the average of the country in the Corn Belt and Lake States. There the yields of oats are large and the acreage per farm is above the average of the country. Threshing rates for oats, in 1938 and 1945, were generally above average in the Southern States where per acre yields of oats are low and where the acreage per farm is below average.

Table 9.- Custom combining rates per acre and threshing rates per bushel for specified years

| State | Custom rate per acre for combining | | | | Custom rate per bushel for threshing | | |
|----------------|------------------------------------|---------|---------|---------|--------------------------------------|--------|-------|
| | Wheat | | Oats | | Wheat | Oats | |
| | 1938 | 1945 | 1938 | 1945 | 1938 | 1938 | 1945 |
| | Dollars | Dollars | Dollars | Dollars | Cents | Cents | Cents |
| New England | 1/ | 1/ | 1/ | 1/ | 9.2 | 7.0 | 9.4 |
| New York | 3.15 | 4.45 | 3.15 | 4.35 | 6.3 | 4.8 | 6.5 |
| New Jersey | 3.95 | 5.40 | 3.85 | 4.95 | 10.3 | 6.9 | 8.6 |
| Pennsylvania | 3.20 | 4.00 | 3.15 | 4.00 | 3.9 | 4.2 | 3.8 |
| Delaware | 2.75 | 4.00 | 2.75 | 3.95 | 7.1 | 5.0 | 7.5 |
| Maryland | 2.70 | 4.20 | 3.00 | 4.20 | 6.1 | 4.5 | 6.3 |
| Northeast | 2/ 3.08 | 2/ 4.18 | 2/ 3.16 | 2/ 4.18 | 6.2 | 4.8 | 5.5 |
| Ohio | 2.50 | 3.70 | 2.50 | 3.60 | 5.8 | 3.7 | 5.0 |
| Indiana | 2.20 | 3.60 | 2.15 | 3.60 | 5.8 | 3.5 | 4.5 |
| Illinois | 2.20 | 3.60 | 2.10 | 3.20 | 5.3 | 2.7 | 3.3 |
| Iowa | 2.35 | 3.85 | 2.35 | 3.70 | 5.2 | 2.7 | 3.3 |
| Missouri | 2.30 | 3.50 | 2.25 | 3.40 | 5.1 | 3.6 | 5.5 |
| Corn Belt | 2.31 | 3.61 | 2.26 | 3.51 | 5.7 | 2.9 | 3.7 |
| Michigan | 2.65 | 3.55 | 2.65 | 3.55 | 5.3 | 3.8 | 4.9 |
| Wisconsin | 2.65 | 3.75 | 2.65 | 3.75 | 5.1 | 3.4 | 4.3 |
| Minnesota | 2.20 | 3.40 | 2.20 | 3.40 | 5.3 | 3.1 | 3.5 |
| Lake States | 2.33 | 3.48 | 2.32 | 3.33 | 5.3 | 3.3 | 4.0 |
| North Dakota | 1.80 | 3.65 | 1.90 | 3.55 | 9.0 | 5.4 | 7.1 |
| South Dakota | 1.70 | 3.60 | 1.95 | 3.75 | 6.2 | 3.5 | 4.3 |
| Nebraska | 2.05 | 3.90 | 2.10 | 3.70 | 5.5 | 3.5 | 4.9 |
| Kansas | 1.85 | 3.40 | 2.35 | 3.20 | 6.6 | 4.2 | 6.8 |
| Great Plains | 1.85 | 3.36 | 2.01 | 3.55 | 6.3 | 4.0 | 5.1 |
| West Virginia | 2.80 | 4.00 | 2.75 | 4.00 | 6.2 | 4.6 | 7.3 |
| Kentucky | 2.55 | 4.15 | 2.35 | 4.05 | 8.3 | 5.1 | 8.5 |
| Tennessee | 2.25 | 4.00 | 2.65 | 4.15 | 7.9 | 5.3 | 8.3 |
| Appalachian | 2.58 | 4.06 | 2.50 | 4.10 | 7.9 | 5.0 | 8.1 |
| Virginia | 2.85 | 4.10 | 3.20 | 4.10 | 5.9 | 4.4 | 7.0 |
| North Carolina | 2.90 | 3.90 | 2.60 | 4.00 | 6.1 | 4.1 | 7.3 |
| South Carolina | 2.80 | 4.00 | 2.75 | 4.00 | 8.7 | 4.8 | 7.5 |
| Georgia | 2.65 | 4.00 | 2.50 | 4.00 | 8.9 | 5.3 | 8.0 |
| Alabama | 2.30 | 4.00 | 2.25 | 4.00 | 9.3 | 5.9 | 8.5 |
| Southeast | 2.84 | 4.00 | 2.64 | 4.01 | 6.5 | 4.9 | 7.7 |
| Mississippi | - | 4.10 | 2.45 | 4.05 | - | 7.1 | 9.0 |
| Louisiana | - | - | 3.90 | 5.00 | - | 6.1 | 8.5 |
| Arkansas | 1.90 | 4.20 | 1.75 | 4.15 | 7.6 | 4.7 | 7.2 |
| Delta States | 1.90 | 4.17 | 2.27 | 4.24 | 7.6 | 5.7 | 8.4 |
| Oklahoma | 1.70 | 3.00 | 1.85 | 3.05 | 8.0 | 4.4 | 7.3 |
| Texas | 1.40 | 2.70 | 2.10 | 3.10 | 9.3 | 4.9 | 11.0 |
| Oklahoma-Texas | 1.58 | 2.86 | 1.98 | 3.08 | 8.5 | 4.7 | 9.8 |
| Montana | 1.80 | 3.30 | 1.85 | 3.25 | 7.3 | 4.7 | 5.7 |
| Idaho | 2.60 | 5.60 | 2.75 | 5.60 | 5.8 | 4.6 | 6.4 |
| Wyoming | 2.00 | 3.75 | 2.35 | 3.65 | 5.8 | 4.2 | 5.6 |
| Colorado | 1.95 | 4.35 | 2.75 | 4.15 | 6.5 | 5.0 | 8.7 |
| New Mexico | 1.40 | 2.75 | 2.60 | 3.50 | 7.9 | 5.5 | 8.0 |
| Arizona | 3.15 | 5.50 | 2.85 | 5.50 | 10.0 | 7.0 | 9.5 |
| Utah | 2.40 | 4.30 | 2.80 | 4.50 | 6.7 | 5.5 | 7.6 |
| Nevada | 4.10 | 5.50 | 3.75 | 5.30 | 10.0 | 7.0 | 9.0 |
| Mountain | 1.98 | 3.91 | 2.36 | 4.02 | 6.8 | 4.8 | 6.8 |
| Washington | 2.40 | 5.90 | 2.75 | 6.80 | 7.3 | 4.9 | 7.0 |
| Oregon | 2.25 | 4.90 | 3.40 | 4.80 | 5.7 | 4.4 | 6.0 |
| California | 2.35 | 4.55 | 1/ | 4.75 | 9.0 | 1/ | 6.0 |
| Pacific | 2.35 | 5.50 | 2/ 3.15 | 5.30 | 7.2 | 2/ 4.7 | 6.5 |
| United States | 2/ 1.90 | 2/ 3.66 | 2/ 2.30 | 2/ 3.59 | 6.6 | 2/ 3.6 | 4.8 |

1/ No information obtained.

2/ Average for States reporting.

UTILIZATION OF STRAW

The estimates in this report, which relate to total production of straw if cut at ground level and the quantity of recoverable straw, should be considered only as fairly close approximations. The ratio of production of straw to grain is known to vary somewhat from year to year. It is influenced principally by weather and by damage from disease and insects. Also for a given small-grain crop, the straw-grain ratio varies with the different varieties. The straw-grain ratios of this report represent approximately average straw-grain ratios for the different grain crops and are based chiefly on experimental data supplied by specialists of the Bureau of Plant Industry, Soils, and Agricultural Engineering.

The proportion of the total production of straw that is recoverable for farm uses—as for bedding, feed or for sale—depends largely upon the height at which the crop is cut and the method of threshing. With binders, reapers, cradles, and mowers, farmers usually cut their grain at a lower level than is done with windrowers or combines. The stationary threshers lose practically no straw, but when combines are used, the chaff, short straw, and long straw are usually so scattered over the stubble and ground surface that only the long straw can be readily collected.

The straw-grain ratios for the different small grains and for the specified harvest methods are shown in table 10. For small grains threshed with stationary threshers or cut and fed unthreshed it was assumed that 80 percent of the total straw produced, if cut at the ground level, was cut and recoverable.

Table 10.—Estimated production of straw per 1,000 bushels of grain harvested

| Small- grain crop | Total straw: | | Straw cut if | | Straw recoverable if | |
|-------------------------|---------------------------------------|-----------------------------|--|---|--|---|
| | yield if cut at ground level | Harvested: by binders | Combined: Windrow as combined | Harvested: Windrow as standing | Combined: binders as combined | Harvested: Windrow as standing |
| | Tons | Tons | Tons | Tons | Tons | Tons |
| Wheat | 70.0 | 56.0 | 49.0 | 42.0 | 56.0 | 34.3 |
| Oats | 26.0 | 20.8 | 18.2 | 15.6 | 20.8 | 12.7 |
| Barley | 35.4 | 24.8 | 22.0 | 18.8 | 24.8 | 15.4 |
| Rye | 87.5 | 70.0 | 61.3 | 52.5 | 70.0 | 42.9 |
| Flax | 84.0 | 67.2 | 58.8 | 50.4 | 67.2 | 41.2 |
| Buckwheat | 40.0 | 32.0 | 28.0 | 24.0 | 32.0 | 19.6 |
| Rice | 33.8 | 27.0 | 23.7 | 20.3 | 27.0 | 16.6 |
| | | | | | | |

1/ For the small acreage that was cut with headers, reapers, cradles, scythes, mowers, etc., it was estimated that the quantity of straw cut and recoverable was the same as when binders were used. These estimates are based largely on information obtained from specialists of the Bureau of Plant Industry.

With the windrow-combine method it was estimated that 70 percent of the total production of straw, if cut at ground level, was cut and only 49 percent was recoverable. For small-grain crops combined as standing grain it was estimated that 60 percent of the total straw was cut and 42 percent was recoverable.

Small-grain straw is an important crop residue. In tonnage it is the largest residue of any crop. The value of straw varies greatly in different parts of the country. In areas where there are many livestock and the animals are housed during the winter, straw has long been considered a valuable byproduct. In the Great Plains and Western small-grain areas, the production of straw is large in relation to needs and is usually of little value, so ordinarily only a little of it is stacked or stored. Straw is bulky, and the expense of baling and transportation usually prevents extensive movement from surplus to deficit areas, or to distant industrial plants.

For centuries straw has been important in some foreign countries. It has been used in brickmaking, as a roofing material, for fuel, for making wearing apparel, for producing many household items, as a substitute for twine, and for feeding and bedding livestock. Industrial utilization in foreign countries, especially as a substitute for pulpwood, has increased greatly of late. In the United States there has been a marked expansion in the use of processed straw, especially for making strawboard, cigarette papers, and high-quality writing paper. Considerable quantities of non-processed straw are used as material for packing and for use in highway construction.

Production of small-grain crops in 1945 was generally at a high level and straw production was correspondingly large. Total production of small-grain straw in 1945 was about 26 percent above average with an estimated production of about 134.5 million tons, compared with the 1935-44 average of about 106.5 million tons (table 11).

Of the total straw produced in 1945 it was estimated that about 43 percent was non-recoverable straw (including stubble, and short straw and chaff) remaining in fields where the grain is harvested with combines. Most of the non-recoverable straw is returned to the soil where it supplies humus and plant food. Of the total small-grain straw, it was estimated that about 57 percent or about 76 million tons was recoverable or could have been readily collected for farm use or for sale. Of the recoverable straw, it was estimated that about 9 million tons were baled, about 25 million tons were used or sold as loose straw, and about 42 million tons were left in the fields or otherwise not utilized. In the Northeastern States a high proportion of the recoverable straw was utilized, as was the case in the Lake States and Appalachian States. A higher proportion of the recoverable straw was baled in the Corn Belt States than in other State groups. In Oklahoma and Texas, in the Great Plains States, and in some Mountain and Pacific Coast States, only a little straw was baled and the utilization of recoverable straw was much below other areas.

Table 11.- Estimated production and utilization of small-grain straw 1/

| State | Estimated yearly average : | | | Straw production in 1945 that was: | | Percentage of recoverable straw in 1945 that was: | | | Left in field or other- wise not used |
|----------------|---|---|--------------------------------|------------------------------------|-------------------------------------|---|-------------------------------------|------------------|---------------------------------------|
| | straw production if cut at ground level | Left in field as stubble, and chaff, and short straw from combines 2/ | Recoverable straw from sale 3/ | able for use on farm or for sale | Used on farm or sold as baled straw | Used loose straw | Used on farm or sold as baled straw | Used loose straw | |
| | 1,000 tons | 1,000 tons | 1,000 tons | 1,000 tons | 1,000 tons | Percent | Percent | Percent | |
| New England | 185 | 172 | 134 | 36 | 98 | 4.1 | 77.5 | 18.4 | |
| New York | 1,333 | 1,373 | 1,306 | 467 | 839 | 24.0 | 56.2 | 19.8 | |
| New Jersey | 160 | 145 | 148 | 77 | 71 | 67.6 | 9.9 | 22.5 | |
| Pennsylvania | 2,384 | 2,101 | 2,305 | 753 | 1,550 | 25.9 | 62.3 | 11.8 | |
| Delaware | 112 | 113 | 127 | 56 | 71 | 25.4 | 49.3 | 25.3 | |
| Maryland | 686 | 602 | 602 | 199 | 402 | 23.6 | 58.2 | 18.2 | |
| Northeast | 4,860 | 4,504 | 4,621 | 1,590 | 3,031 | 22.3 | 59.0 | 15.7 | |
| Ohio | 4,175 | 4,008 | 3,885 | 2,418 | 2,957 | 33.4 | 27.5 | 39.1 | |
| Indiana | 3,204 | 3,015 | 4,071 | 1,907 | 2,164 | 34.6 | 21.5 | 43.9 | |
| Illinois | 6,002 | 5,375 | 5,859 | 2,692 | 3,167 | 38.7 | 21.5 | 39.8 | |
| Iowa | 6,514 | 5,317 | 5,613 | 1,932 | 3,701 | 35.5 | 49.1 | 15.4 | |
| Missouri | 3,511 | 2,743 | 2,110 | 778 | 1,232 | 25.6 | 33.7 | 38.7 | |
| Corn Belt | 23,407 | 20,528 | 23,038 | 9,707 | 13,331 | 34.7 | 31.9 | 33.4 | |
| Michigan | 2,663 | 2,747 | 3,076 | 1,539 | 2,137 | 26.7 | 42.1 | 31.2 | |
| Wisconsin | 3,121 | 3,333 | 4,305 | 1,087 | 3,218 | 9.8 | 81.9 | 8.3 | |
| Minnesota | 8,481 | 8,378 | 9,416 | 2,548 | 6,868 | 11.4 | 64.0 | 24.6 | |
| Lake States | 14,265 | 14,573 | 17,397 | 5,174 | 12,223 | 13.6 | 64.9 | 21.5 | |
| North Dakota | 6,399 | 14,074 | 16,087 | 6,569 | 9,518 | 1.1 | 21.2 | 77.7 | |
| South Dakota | 3,847 | 6,611 | 9,090 | 3,127 | 5,963 | 2.8 | 41.6 | 55.6 | |
| Nebraska | 4,953 | 6,063 | 8,635 | 3,782 | 4,853 | 4.1 | 32.3 | 63.6 | |
| Kansas | 9,731 | 13,627 | 15,377 | 8,586 | 6,791 | 1.8 | 4.6 | 93.6 | |
| Great Plains | 24,930 | 41,175 | 49,189 | 22,064 | 27,125 | 2.2 | 23.5 | 74.3 | |
| West Virginia | 224 | 169 | 184 | 39 | 145 | 13.1 | 74.5 | 12.4 | |
| Kentucky | 527 | 564 | 497 | 172 | 325 | 29.5 | 31.4 | 39.1 | |
| Tennessee | 446 | 543 | 581 | 197 | 384 | 21.1 | 38.3 | 40.6 | |
| Appalachian | 1,191 | 1,276 | 1,262 | 408 | 854 | 22.9 | 41.8 | 35.3 | |
| Virginia | 735 | 767 | 747 | 223 | 524 | 24.2 | 53.8 | 22.0 | |
| North Carolina | 508 | 752 | 730 | 310 | 420 | 28.1 | 32.9 | 39.0 | |
| South Carolina | 409 | 590 | 729 | 276 | 453 | 11.5 | 50.1 | 38.4 | |
| Georgia | 336 | 457 | 648 | 247 | 401 | 7.7 | 50.1 | 42.2 | |
| Florida | 3 | 6 | 23 | 9 | 14 | 14.3 | 42.9 | 42.8 | |
| Alabama | 56 | 115 | 193 | 72 | 121 | 10.7 | 53.4 | 33.9 | |
| Southeast | 2,127 | 2,687 | 3,070 | 1,137 | 1,933 | 17.7 | 47.7 | 34.6 | |
| Mississippi | 67 | 282 | 418 | 192 | 226 | 12.4 | 25.7 | 61.9 | |
| Arkansas | 477 | 622 | 693 | 190 | 503 | 4.6 | 18.9 | 76.5 | |
| Louisiana | 724 | 803 | 873 | 264 | 609 | 4.3 | 55.0 | 40.7 | |
| Delta States | 1,268 | 1,707 | 1,984 | 646 | 1,338 | 5.8 | 36.5 | 57.7 | |
| Oklahoma | 4,418 | 5,019 | 5,890 | 3,088 | 2,802 | 2.0 | 12.4 | 85.6 | |
| Texas | 3,352 | 4,560 | 5,241 | 2,666 | 2,575 | 2.8 | 14.5 | 82.7 | |
| Oklahoma-Texas | 7,770 | 9,579 | 11,131 | 5,754 | 5,377 | 2.4 | 13.4 | 84.2 | |
| Montana | 2,818 | 5,855 | 4,893 | 2,538 | 2,355 | .5 | 21.0 | 78.5 | |
| Idaho | 2,173 | 2,407 | 2,891 | 1,333 | 1,558 | 4.0 | 35.8 | 60.2 | |
| Wyoming | 301 | 467 | 563 | 237 | 326 | 1.5 | 47.9 | 50.6 | |
| Colorado | 1,343 | 2,359 | 3,565 | 1,615 | 1,950 | 3.8 | 40.7 | 55.5 | |
| New Mexico | 186 | 266 | 244 | 124 | 120 | 1.7 | 25.0 | 73.3 | |
| Arizona | 112 | 139 | 172 | 93 | 79 | 3.8 | 12.7 | 83.5 | |
| Utah | 535 | 688 | 742 | 293 | 449 | 9.8 | 53.2 | 37.0 | |
| Nevada | 44 | 68 | 66 | 36 | 30 | 3.3 | 23.3 | 73.4 | |
| Mountain | 7,512 | 12,249 | 13,136 | 6,269 | 6,867 | 9.0 | 33.3 | 63.7 | |
| Washington | 3,669 | 4,413 | 4,645 | 2,534 | 2,111 | 3.2 | 14.0 | 82.8 | |
| Oregon | 1,739 | 2,037 | 2,044 | 1,123 | 921 | 5.3 | 14.8 | 79.9 | |
| California | 2,799 | 2,838 | 3,001 | 1,706 | 1,295 | 7.0 | 4.7 | 88.3 | |
| Pacific | 8,207 | 9,288 | 9,690 | 5,363 | 4,327 | 4.8 | 11.4 | 83.8 | |
| United States | 95,543 | 117,463 | 134,518 | 58,112 | 76,406 | 11.6 | 33.5 | 54.9 | |

1/ Includes wheat, oats, barley, rye, flaxseed, buckwheat, and rice.

2/ Includes straw left as stubble, and chaff and straw too short to recover by raking fields where grain was combined.

3/ Includes chaff from grain threshed with stationary threshers.

Wheat Straw

Wheat straw is the chief small-grain straw, amounting to about 78 million tons or 58 percent of the total straw produced in 1945. A higher proportion of the wheat crop was combine-harvested than was the case of any other small grain, and recoverable wheat straw was estimated at only 52 percent of the total recoverable straw for all small-grain crops. Production of wheat straw in 1945 was high, reflecting the large wheat crop, and was estimated at about 31 percent above the 1935-44 average (table 12). Of the total wheat straw only about 40 million tons, or about 51 percent, was estimated as recoverable. About 9 percent of the recoverable straw was used or sold as baled straw, 19 percent was used or sold as loose straw, and 72 percent was left in field or otherwise not utilized.

In most counties of the Northeast States, the Eastern Corn Belt, the Lake States, and in Virginia and West Virginia, a high proportion of the wheat straw is utilized, either for baling, for feed on farms where grown or sold. But little wheat straw is used for these purposes in the important wheat producing counties of the Great Plains, Oklahoma-Texas, the Mountain States or the Pacific Coast States. For other information regarding county utilization of wheat straw see figure 4.

Baling of wheat straw was relatively more important in the Corn Belt where more than half of the straw used on farms or sold was baled. In the Northeastern States and the Appalachian States, baling of straw was above average. In most States west of the Mississippi River only a small proportion was baled. Trade sources indicate that about 700,000 tons of baled wheat straw is usually bought each year by the manufacturers of straw and the Corn Belt States account for about two-thirds of this amount. Definite figures are not available, but it is believed there has been a decided increase in recent years in the baling of wheat straw. The combine method is now important in practically all wheat areas, and when the crop is combine-harvested the windrow pick-up baler can generally be used satisfactorily for saving the straw. In Indiana about 60 percent of the wheat straw baled in 1945 was handled with windrow pick-up balers, according to reports from crop correspondents.

Oat Straw

Oat straw production was second to wheat straw in tonnage. In 1945 it amounted to 30 percent of total straw production and 35 percent of the recoverable straw from all small-grain crops. Oat straw production in 1945 was large reflecting the record oat crop, and was about 36 percent above the 1935-44 average (table 13).

Of the oat straw produced in 1945 about 40 million tons, or about two-thirds was recoverable. The remainder was left in fields in the form of stubble and short straw, and chaff from grain harvested by combines.

Table 12.- Estimated production and utilization of wheat straw

| State | Estimated yearly average wheat-straw production if cut at ground level | | | Straw production in 1945 that was: | | Percentage of recoverable straw in 1945 that was: | | |
|----------------|--|------------|------------|--|--|---|--------------------------------|-----------------------|
| | 1935-39 | 1940-44 | 1945 | Left in field as stubble, and chaff and short straw from combines 1/ | Recoverable for use on farm or for sale 2/ | Used on farms or sold as baled straw | Used on or sold as loose straw | Left in field or used |
| | 1,000 tons | 1,000 tons | 1,000 tons | 1,000 tons | Percent | Percent | Percent | |
| Maine | 6 | 3 | 1 | 750 | 1 | 3/ 25.0 | 3/ 63.0 | 3/ 10.0 |
| New York | 483 | 500 | 440 | 344 | 306 | 32.0 | 46.0 | 22.0 |
| New Jersey | 92 | 83 | 93 | 48 | 44 | 71.0 | 9.0 | 20.0 |
| Pennsylvania | 1,452 | 1,170 | 1,403 | 467 | 936 | 30.0 | 60.0 | 10.0 |
| Delaware | 99 | 69 | 91 | 59 | 52 | 24.0 | 51.0 | 25.0 |
| Maryland | 786 | 475 | 474 | 158 | 115 | 22.0 | 38.0 | 17.0 |
| Northeast | 2,722 | 2,119 | 2,702 | 921 | 1,742 | 30.4 | 25.2 | 14.7 |
| Ohio | 3,048 | 2,821 | 3,024 | 1,815 | 2,209 | 37.0 | 27.0 | 36.0 |
| Indiana | 2,091 | 1,658 | 2,419 | 1,176 | 1,273 | 36.0 | 26.0 | 44.0 |
| Illinois | 2,669 | 1,739 | 2,737 | 881 | 956 | 34.0 | 32.0 | 60.0 |
| Iowa | 638 | 261 | 186 | 76 | 110 | 36.0 | 34.0 | 38.0 |
| Missouri | 2,343 | 1,320 | 2,718 | 1,071 | 171 | 31.0 | 13.0 | 12.0 |
| Corn Belt | 10,809 | 7,349 | 3,974 | 4,425 | 5,219 | 32.9 | 23.8 | 39.3 |
| Michigan | 1,260 | 1,167 | 1,890 | 530 | 1,060 | 31.0 | 37.0 | 32.0 |
| Wisconsin | 126 | 105 | 103 | 38 | 75 | 3/ 8.0 | 2/ 82.0 | 3/ 10.0 |
| Minnesota | 1,822 | 1,581 | 1,467 | 428 | 1,059 | 5.0 | 54.0 | 41.0 |
| Lake States | 3,208 | 2,379 | 2,480 | 1,266 | 2,194 | 11.7 | 35.7 | 51.6 |
| North Dakota | 3,884 | 9,897 | 10,620 | 4,609 | 6,211 | 1.0 | 33.0 | 34.0 |
| South Dakota | 1,282 | 2,483 | 3,476 | 1,394 | 2,082 | 2.5 | 27.0 | 70.5 |
| Nebraska | 3,131 | 3,333 | 3,765 | 2,877 | 2,888 | 3.5 | 13.3 | 83.0 |
| Kansas | 8,531 | 11,702 | 14,526 | 3,234 | 6,332 | 2.5 | 2.5 | 96.0 |
| Great Plains | 16,328 | 27,112 | 34,617 | 17,104 | 17,513 | 1.5 | 11.7 | 85.5 |
| West Virginia | 154 | 105 | 113 | 24 | 39 | 17.0 | 71.0 | 21.0 |
| Kentucky | 457 | 416 | 351 | 127 | 224 | 32.0 | 23.0 | 45.0 |
| Tennessee | 356 | 370 | 318 | 108 | 210 | 22.0 | 25.0 | 43.0 |
| Appalachian | 967 | 891 | 782 | 259 | 523 | 25.4 | 36.0 | 38.6 |
| Virginia | 586 | 567 | 532 | 164 | 368 | 26.0 | 50.0 | 24.0 |
| North Carolina | 397 | 509 | 400 | 185 | 215 | 34.0 | 16.0 | 50.0 |
| South Carolina | 124 | 220 | 208 | 100 | 108 | 10.0 | 10.0 | 80.0 |
| Georgia | 113 | 164 | 173 | 81 | 92 | 8.0 | 13.0 | 79.0 |
| Alabama | 4 | 10 | 22 | 11 | 11 | 12.0 | 21.0 | 67.0 |
| Southeast | 1,224 | 1,470 | 1,335 | 541 | 794 | 23.7 | 30.7 | 43.6 |
| Mississippi | --- | 17 | 26 | 14 | 12 | 5.0 | 7.0 | 88.0 |
| Arkansas | 50 | 24 | 29 | 11 | 18 | 15.0 | 20.0 | 65.0 |
| Delta States | 50 | 41 | 55 | 25 | 30 | 11.0 | 14.8 | 74.2 |
| Oklahoma | 3,516 | 3,947 | 5,171 | 2,823 | 2,348 | .5 | 6.5 | 93.0 |
| Texas | 1,906 | 2,975 | 3,371 | 1,864 | 1,507 | .4 | 3.0 | 96.6 |
| Oklahoma-Texas | 5,422 | 6,922 | 8,542 | 4,567 | 3,855 | .5 | 5.1 | 94.4 |
| Montana | 2,483 | 4,637 | 1,000 | 2,116 | 1,884 | .5 | 17.0 | 82.5 |
| Idaho | 1,824 | 1,791 | 2,291 | 1,063 | 1,226 | 4.0 | 34.0 | 62.0 |
| Wyoming | 157 | 254 | 296 | 134 | 162 | 2.0 | 34.0 | 64.0 |
| Colorado | 896 | 1,612 | 2,483 | 1,165 | 1,318 | 4.0 | 35.0 | 61.0 |
| New Mexico | 161 | 207 | 194 | 104 | 90 | 1.0 | 19.0 | 80.0 |
| Arizona | 71 | 38 | 35 | 20 | 15 | 2.5 | 22.0 | 75.5 |
| Utah | 383 | 424 | 474 | 194 | 280 | 10.0 | 49.0 | 41.0 |
| Nevada | 29 | 34 | 34 | 19 | 15 | 2.0 | 17.0 | 80.0 |
| Mountain | 6,904 | 9,197 | 9,807 | 4,817 | 4,990 | 2.9 | 28.3 | 68.8 |
| Washington | 3,370 | 3,850 | 4,306 | 2,351 | 1,925 | 2.0 | 12.0 | 86.0 |
| Oregon | 1,325 | 1,444 | 1,527 | 850 | 577 | 3.3 | 13.7 | 83.0 |
| California | 1,175 | 730 | 749 | 431 | 318 | 10.0 | 3.0 | 87.0 |
| Pacific | 5,870 | 6,030 | 6,582 | 3,662 | 2,920 | 2.2 | 11.4 | 85.4 |
| United States | 53,104 | 62,613 | 77,576 | 37,793 | 39,783 | 3.9 | 19.2 | 71.9 |

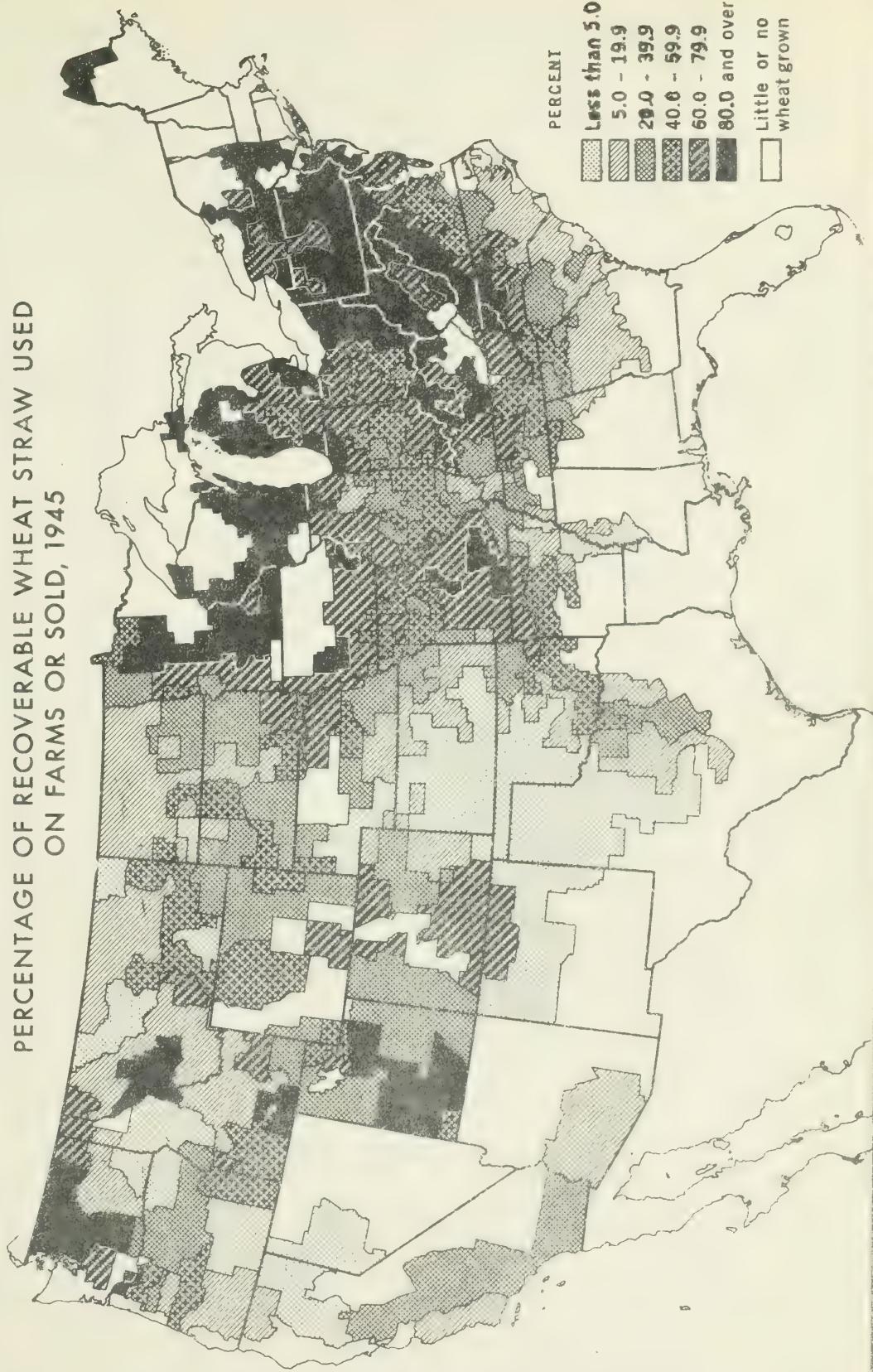
1/ Includes straw left as stubble, and chaff and straw too short to recover by raking fields where grain was combined.

2/ Includes chaff from grain threshed with stationary threshers.

3/ No reports received from crop correspondents. Estimates based largely on reports supplied in adjacent or nearby States.

FOR HORIZONTAL PAGE USE ONLY

PERCENTAGE OF RECOVERABLE WHEAT STRAW USED
ON FARMS OR SOLD, 1945



U. S. DEPARTMENT OF AGRICULTURE

NEG. 46321

BUREAU OF AGRICULTURAL ECONOMICS

FIGURE 4

Table 13.- Estimated production and utilization of oat straw

| State | Estimated yearly average | | | Straw production in 1945 that was: | | Percentage of recoverable straw in 1945 that was: | | |
|-----------------------|---|---------------|---------------|---|------------------------------|---|-------------------------------------|-------------------------|
| | oat-straw production if cut at ground level | 1935-39 | 1940-44 | Left in field as stubble, and chaff and straw too short to recover by raking fields | Recoverable for farm or sale | Used on farm or sold as baled straw | Used on farm or sold as loose straw | Used for other purposes |
| | 1,000 tons | 1,000 tons | 1,000 tons | 1,000 tons | 1,000 tons | Percent | Percent | Percent |
| New England | 163 | 154 | 123 | 33 | 90 | 4.0 | 78.0 | 18.0 |
| New York | 599 | 647 | 500 | 158 | 342 | 16.0 | 70.0 | 14.0 |
| New Jersey | 36 | 33 | 28 | 14 | 14 | 61.0 | 20.0 | 19.0 |
| Pennsylvania | 662 | 647 | 639 | 201 | 438 | 19.0 | 69.0 | 12.0 |
| Delaware | 2 | 3 | 4 | 2 | 2 | 40.0 | 45.0 | 15.0 |
| Maryland | 27 | 27 | 20 | 8 | 21 | 13.0 | 70.0 | 17.0 |
| Northeast | 1,480 | 1,511 | 1,323 | 416 | 907 | 16.9 | 69.5 | 13.6 |
| Ohio | 1,021 | 1,112 | 1,285 | 266 | 716 | 23.0 | 29.0 | 48.0 |
| Indiana | 941 | 1,150 | 1,497 | 674 | 323 | 33.0 | 24.0 | 43.0 |
| Illinois | 3,092 | 3,399 | 4,032 | 1,770 | 2,263 | 43.0 | 25.0 | 32.0 |
| Iowa | 5,249 | 4,610 | 5,328 | 1,796 | 3,532 | 36.0 | 50.0 | 14.0 |
| Missouri | 1,031 | 1,266 | 746 | 239 | 507 | 32.0 | 40.0 | 28.0 |
| Corn Belt | 11,374 | 11,537 | 12,888 | 3,647 | 7,841 | 36.3 | 37.5 | 26.2 |
| Michigan | 1,090 | 1,262 | 1,565 | 620 | 945 | 23.0 | 47.0 | 30.0 |
| Wisconsin | 1,896 | 2,565 | 3,961 | 998 | 2,963 | 10.0 | 82.0 | 8.0 |
| Minnesota | 3,743 | 4,020 | 6,309 | 1,640 | 4,669 | 10.0 | 71.0 | 19.0 |
| Lake States | 8,691 | 7,347 | 11,815 | 3,258 | 8,777 | 11.4 | 72.2 | 16.4 |
| North Dakota | 791 | 1,676 | 2,242 | 751 | 1,491 | 1.0 | 45.0 | 54.0 |
| South Dakota | 1,044 | 1,880 | 3,728 | 1,081 | 2,647 | 2.0 | 56.0 | 42.0 |
| Nebraska | 1,819 | 1,321 | 1,998 | 581 | 1,417 | 6.0 | 66.0 | 28.0 |
| Kansas | 928 | 1,074 | 440 | 169 | 271 | 10.0 | 42.0 | 48.0 |
| Great Plains | 3,782 | 2,931 | 8,408 | 2,552 | 5,826 | 3.1 | 55.0 | 41.9 |
| West Virginia | 44 | 43 | 50 | 10 | 40 | 10.0 | 82.0 | 8.0 |
| Kentucky | 33 | 44 | 57 | 15 | 42 | 11.0 | 78.0 | 11.0 |
| Tennessee | 75 | 74 | 166 | 52 | 114 | 23.0 | 47.0 | 30.0 |
| Appalachian | 122 | 161 | 273 | 77 | 196 | 17.8 | 66.8 | 21.4 |
| Virginia | 51 | 79 | 103 | 26 | 77 | 18.0 | 72.0 | 10.0 |
| North Carolina | 139 | 174 | 268 | 98 | 170 | 21.0 | 56.0 | 23.0 |
| South Carolina | 271 | 344 | 492 | 164 | 328 | 12.0 | 63.0 | 23.0 |
| Georgia | 211 | 273 | 461 | 159 | 302 | 8.0 | 62.0 | 30.0 |
| Florida | 3 | 6 | 23 | 9 | 14 | 10.0 | 46.0 | 44.0 |
| Alabama | 52 | 103 | 170 | 61 | 109 | 11.0 | 59.0 | 30.0 |
| Southeast | 727 | 979 | 1,517 | 517 | 1,000 | 12.6 | 62.2 | 25.2 |
| Mississippi | 67 | 261 | 387 | 175 | 212 | 12.0 | 27.0 | 61.0 |
| Arkansas | 128 | 189 | 213 | 71 | 142 | 11.0 | 59.0 | 30.0 |
| Louisiana | 40 | 90 | 95 | 41 | 54 | 8.0 | 35.0 | 57.0 |
| Delta States | 235 | 540 | 695 | 287 | 468 | 11.1 | 39.2 | 49.7 |
| Oklahoma | 736 | 706 | 545 | 175 | 370 | 12.0 | 50.0 | 38.0 |
| Texas | 949 | 796 | 1,075 | 440 | 635 | 10.0 | 25.0 | 65.0 |
| Oklahoma-Texas | 1,685 | 1,502 | 1,620 | 615 | 1,005 | 10.7 | 34.2 | 55.1 |
| Montana | 183 | 411 | 244 | 92 | 152 | 1.0 | 58.0 | 41.0 |
| Idaho | 154 | 185 | 191 | 78 | 113 | 4.0 | 56.0 | 40.0 |
| Wyoming | 74 | 97 | 128 | 44 | 84 | 2.0 | 70.0 | 28.0 |
| Colorado | 113 | 143 | 200 | 60 | 140 | 5.0 | 71.0 | 24.0 |
| New Mexico | 15 | 23 | 25 | 9 | 16 | 5.0 | 46.0 | 49.0 |
| Arizona | 5 | 7 | 10 | 4 | 6 | 5.0 | 40.0 | 55.0 |
| Utah | 36 | 47 | 52 | 17 | 35 | 10.0 | 68.0 | 22.0 |
| Nevada | 3 | 7 | 9 | 5 | 4 | 10.0 | 30.0 | 40.0 |
| Mountain | 583 | 920 | 859 | 309 | 550 | 3.6 | 62.8 | 33.6 |
| Washington | 199 | 219 | 168 | 68 | 100 | 25.0 | 43.0 | 32.0 |
| Oregon | 233 | 256 | 209 | 105 | 104 | 20.0 | 24.0 | 56.0 |
| California | 109 | 129 | 133 | 71 | 62 | 19.0 | 20.0 | 61.0 |
| Pacific | 541 | 604 | 510 | 244 | 266 | 21.7 | 30.2 | 48.1 |
| United States | 27,179 | 31,552 | 39,928 | 13,352 | 26,576 | 17.1 | 55.1 | 27.8 |

1/ Includes all straw left as stubble, and chaff and straw too short to recover by raking fields where grain was combined.

2/ Includes chaff from grain threshed with stationary threshers.

Oat straw contains more leafy material than other small-grain straws. Most farmers prefer it for bedding and feed. It was estimated that about 72 percent of the 1945 recoverable oat straw was used on farms or sold. This is a higher percentage than for any other small-grain straw. According to reports from the crop correspondent about 17 percent of the recoverable oat straw was baled. Baling straw was especially important in the Corn Belt States where about a third of the oat crop in 1945 was grown. In Indiana, of the oat straw baled that year about 50 percent was done with windrow pick-up balers.

In all State groups a higher proportion of oat straw was used on farms or sold as loose straw than any other small-grain straw in 1945; with about 55 percent of the recoverable straw used as loose straw. In the Northeastern, Lake, Mountain, Appalachian and Southeastern States more than 60 percent of the recoverable oat straw was used or sold as loose straw. In Oklahoma-Texas, the Delta States, and the Pacific Coast States around 50 percent was left in fields or was not otherwise used.

Barley Straw

Barley straw is third in importance among small-grain straws, but in 1945 it was only about 7 percent of the total straw production. Production of barley straw in 1945 was estimated at about 8 percent below the 1935-44 average, reflecting a similar decline in barley for grain. Of the barley straw, approximately 57 percent was estimated to be recoverable (table 14). Only about 4 percent of the recoverable straw was used on farms or sold as baled straw but more than a third of it was used or sold as loose straw. Utilization of barley straw was above average in the Northeastern States, and the Southeastern States and in the Lake States where smoothawn varieties predominate. In the Pacific Coast States and in Oklahoma and Texas around 90 percent of the recoverable barley straw was left in fields or was otherwise not used. Use by strawboard manufacturers is limited, as they prefer wheat or rye straw.

Rye Straw

Production of rye straw in 1945 was about 55 percent of the 1935-44 average, reflecting the sharp decline in production of rye. Until recently, rye has been fourth in importance of the small-grain straws but with the increasing production of flaxseed, it was fifth in importance in 1945 amounting to less than 2 percent of the total straw. More than 60 percent of the indicated production of rye straw was estimated as recoverable, but more than half of this was left in fields or was otherwise not used. About 11 percent of the recoverable rye straw was used on farms or sold as baled straw and about 36 percent was used on farms or sold as loose straw (table 15). Baling was relatively important in the Corn Belt and the Northeastern States where total utilization of rye straw was above average. Utilization was below average in most States west of the Mississippi River. Rye straw has comparatively important nonfarm uses and is generally considered the equal of wheat straw in making strawboard.

Table 14.- Estimated production and utilization of barley straw

| State | Estimated yearly average | | | Straw production in 1945 that was: | | Percentage of recoverable straw in 1945 that was: | | |
|----------------|--|--|------------|------------------------------------|------------|---|-------------------------------------|-------------------------------------|
| | barley-straw production if cut at ground level | Left in field as stubble, and chaff and short straw from combines 1/ | 1,000 tons | 1,000 tons | 1,000 tons | Used on farm or for sale | Used on farm or sold as baled straw | Used on farm or sold as loose straw |
| New England | 10 | 9 | 5 | 2 | 3 | 3/ 9.0 | 3/ 61.0 | 3/ 30.0 |
| New York | 126 | 98 | 90 | 38 | 52 | 3/ 30.0 | 3/ 50.0 | 3/ 20.0 |
| New Jersey | 3 | 7 | 9 | 5 | 4 | 76.0 | 9.0 | 15.0 |
| Pennsylvania | 79 | 120 | 126 | 44 | 82 | 33.0 | 52.0 | 15.0 |
| Delaware | 2 | 8 | 10 | 5 | 5 | 35.0 | 40.0 | 25.0 |
| Maryland | 47 | 73 | 67 | 21 | 46 | 21.0 | 25.0 | 24.0 |
| Northeast | 267 | 315 | 307 | 115 | 192 | 29.2 | 21.1 | 19.0 |
| Ohio | 17 | 36 | 24 | 12 | 12 | 15.0 | 14.0 | 71.0 |
| Indiana | 19 | 60 | 37 | 17 | 20 | 21.0 | 17.0 | 62.0 |
| Illinois | 103 | 108 | 27 | 13 | 14 | 14.0 | 28.0 | 58.0 |
| Iowa | 424 | 178 | 3 | 1 | 2 | 3/ 25.0 | 3/ 35.0 | 3/ 40.0 |
| Missouri | 83 | 107 | 44 | 16 | 28 | 15.0 | 37.0 | 48.0 |
| Corn Belt | 646 | 489 | 135 | 59 | 76 | 16.7 | 26.4 | 56.9 |
| Michigan | 179 | 190 | 130 | 53 | 77 | 3/ 16.0 | 3/ 51.0 | 3/ 33.0 |
| Wisconsin | 788 | 503 | 128 | 33 | 95 | 8.0 | 83.0 | 9.0 |
| Minnesota | 1,758 | 1,327 | 459 | 132 | 327 | 3.0 | 56.0 | 41.0 |
| Lake States | 2,725 | 2,020 | 717 | 218 | 499 | 5.9 | 60.4 | 33.7 |
| North Dakota | 835 | 1,853 | 1,860 | 701 | 1,159 | .6 | 28.4 | 71.0 |
| South Dakota | 858 | 1,339 | 1,127 | 374 | 753 | 1.3 | 43.7 | 55.0 |
| Nebraska | 451 | 1,027 | 475 | 180 | 295 | 1.3 | 44.7 | 54.0 |
| Kansas | 176 | 645 | 251 | 126 | 125 | 1.5 | 30.5 | 68.0 |
| Great Plains | 2,320 | 4,864 | 3,713 | 1,381 | 2,332 | 1.0 | 35.5 | 63.5 |
| West Virginia | 6 | 9 | 9 | 2 | 7 | 5.0 | 86.0 | 9.0 |
| Kentucky | 23 | 77 | 44 | 15 | 29 | 30.0 | 30.0 | 40.0 |
| Tennessee | 24 | 63 | 63 | 26 | 37 | 14.0 | 27.0 | 59.0 |
| Appalachian | 53 | 149 | 116 | 43 | 73 | 19.5 | 33.8 | 46.7 |
| Virginia | 47 | 69 | 65 | 19 | 46 | 22.0 | 61.0 | 17.0 |
| North Carolina | 8 | 30 | 31 | 15 | 16 | 26.0 | 22.0 | 52.0 |
| South Carolina | 3 | 7 | 16 | 7 | 9 | 11.0 | 19.0 | 70.0 |
| Georgia | --- | 5 | 6 | 3 | 3 | 3.0 | 21.0 | 74.0 |
| Alabama | --- | 2 | 1 | --- | 1 | 15.0 | 8.0 | 77.0 |
| Southeast | 58 | 113 | 119 | 44 | 75 | 20.8 | 45.3 | 33.9 |
| Mississippi | --- | 4 | 5 | 3 | 2 | 5.0 | 10.0 | 85.0 |
| Arkansas | 4 | 6 | 5 | 2 | 3 | 20.0 | 39.0 | 41.0 |
| Delta States | 4 | 10 | 10 | 5 | 5 | 14.0 | 27.4 | 58.6 |
| Oklahoma | 122 | 247 | 105 | 55 | 50 | 1.3 | 12.7 | 86.0 |
| Texas | 73 | 222 | 127 | 68 | 59 | 1.3 | 5.7 | 93.0 |
| Oklahoma-Texas | 195 | 469 | 232 | 123 | 109 | 1.3 | 8.9 | 89.8 |
| Montana | 99 | 396 | 523 | 264 | 259 | .3 | 30.7 | 69.0 |
| Idaho | 183 | 420 | 402 | 187 | 215 | 3.5 | 36.0 | 60.5 |
| Wyoming | 58 | 98 | 132 | 56 | 76 | .6 | 53.4 | 46.0 |
| Colorado | 307 | 523 | 798 | 350 | 448 | 3.0 | 49.0 | 48.0 |
| New Mexico | 8 | 24 | 22 | 10 | 12 | 1.0 | 43.0 | 56.0 |
| Arizona | 34 | 62 | 94 | 50 | 44 | 3.5 | 11.0 | 85.5 |
| Utah | 114 | 211 | 207 | 79 | 128 | 10.0 | 58.0 | 32.0 |
| Nevada | 12 | 27 | 23 | 12 | 11 | 10.0 | 15.0 | 75.0 |
| Mountain | 815 | 1,761 | 2,201 | 1,008 | 1,193 | 3.2 | 42.1 | 54.7 |
| Washington | 83 | 305 | 155 | 78 | 77 | 5.0 | 23.0 | 72.0 |
| Oregon | 138 | 287 | 268 | 148 | 120 | 4.5 | 10.0 | 85.5 |
| California | 1,143 | 1,275 | 1,473 | 847 | 626 | 4.0 | 1.0 | 95.0 |
| Pacific | 1,364 | 1,867 | 1,896 | 1,073 | 823 | 4.2 | 4.4 | 91.4 |
| United States | 8,447 | 12,057 | 9,446 | 4,069 | 5,377 | 4.2 | 34.5 | 61.3 |

1/ Includes all straw left as stubble, chaff and straw too short to recover by raking fields where grain was combined.

2/ Includes chaff from grain threshed with stationary threshers.

3/ No reports received from crop correspondents. Estimates based largely on reports supplied in adjacent or nearby States.

Table 15.- Estimated production and utilization of rye straw

| State | Estimated yearly average: | | | Straw | Percentage of recoverable straw in 1945 that was: | | | |
|----------------|---|------------------------------|--|----------------------------|---|-------------------------------------|-----------------------|---------|
| | rye-straw production if cut at ground level | production in 1945 that was: | Left in field as stubble, and chaff and short straw from combines 2/ | Recovered for farm or sale | Used on farm or sold as baled straw | Used on farm or sold as loose straw | Left in field or used | |
| | 1,000 tons | 1,000 tons | 1,000 tons | 1,000 tons | 1,000 tons | Percent | Percent | Percent |
| New York | 33 | 28 | 15 | 5 | 10 | 32.0 | 46.0 | 22.0 |
| New Jersey | 28 | 22 | 18 | 9 | 9 | 66.0 | 5.0 | 29.0 |
| Pennsylvania | 96 | 68 | 56 | 18 | 38 | 30.0 | 57.0 | 13.0 |
| Delaware | 8 | 14 | 22 | 10 | 12 | 29.0 | 42.0 | 29.0 |
| Maryland | 20 | 23 | 25 | 10 | 15 | 23.0 | 51.0 | 26.0 |
| Northeast | 185 | 155 | 136 | 52 | 84 | 32.7 | 46.9 | 20.4 |
| Ohio | 79 | 109 | 41 | 18 | 23 | 35.0 | 30.0 | 35.0 |
| Indiana | 145 | 142 | 77 | 36 | 41 | 37.0 | 20.0 | 43.0 |
| Illinois | 115 | 62 | 51 | 23 | 28 | 35.0 | 13.0 | 52.0 |
| Iowa | 174 | 27 | 13 | 5 | 8 | 30.0 | 35.0 | 35.0 |
| Missouri | 52 | 44 | 39 | 15 | 24 | 23.0 | 33.0 | 44.0 |
| Corn Belt | 565 | 384 | 221 | 97 | 124 | 33.0 | 23.0 | 41.2 |
| Michigan | 154 | 84 | 73 | 29 | 44 | 27.0 | 45.0 | 27.0 |
| Wisconsin | 299 | 139 | 95 | 23 | 72 | 5.0 | 81.0 | 14.0 |
| Minnesota | 632 | 261 | 130 | 38 | 112 | 9.0 | 63.0 | 28.0 |
| Lake States | 1,045 | 484 | 318 | 90 | 228 | 11.2 | 52.5 | 21.4 |
| North Dakota | 708 | 774 | 136 | 51 | 85 | .8 | 6.4 | 92.8 |
| South Dakota | 609 | 651 | 368 | 132 | 236 | 2.0 | 29.0 | 67.0 |
| Nebraska | 351 | 378 | 395 | 143 | 252 | 3.0 | 44.0 | 53.0 |
| Kansas | 63 | 92 | 74 | 37 | 37 | 2.0 | 3.0 | 92.0 |
| Great Plains | 1,731 | 1,893 | 973 | 363 | 610 | 2.2 | 30.5 | 57.3 |
| West Virginia | 9 | 4 | 5 | 1 | 4 | 9.0 | 78.0 | 13.0 |
| Kentucky | 13 | 26 | 44 | 15 | 29 | 35.0 | 30.0 | 35.0 |
| Tennessee | 30 | 34 | 28 | 10 | 18 | 20.0 | 34.0 | 36.0 |
| Appalachian | 52 | 64 | 77 | 26 | 51 | 27.6 | 35.2 | 37.2 |
| Virginia | 45 | 47 | 43 | 13 | 30 | 24.0 | 43.0 | 33.0 |
| North Carolina | 42 | 36 | 29 | 12 | 17 | 31.0 | 22.0 | 47.0 |
| South Carolina | 11 | 19 | 13 | 5 | 8 | 11.0 | 11.0 | 78.0 |
| Georgia | 12 | 15 | 8 | 4 | 4 | 8.0 | 14.0 | 78.0 |
| Southeast | 110 | 117 | 93 | 34 | 59 | 23.2 | 30.6 | 46.2 |
| Oklahoma | 43 | 102 | 65 | 33 | 32 | 1.0 | 8.0 | 91.0 |
| Texas | 7 | 22 | 17 | 9 | 8 | 1.0 | 10.0 | 89.0 |
| Oklahoma-Texas | 50 | 124 | 82 | 42 | 40 | 1.0 | 8.4 | 90.6 |
| Montana | 39 | 44 | 16 | 8 | 8 | 1.0 | 24.0 | 75.0 |
| Idaho | 8 | 9 | 6 | 3 | 3 | 5.0 | 43.0 | 52.0 |
| Wyoming | 12 | 18 | 7 | 3 | 4 | 2.0 | 35.0 | 63.0 |
| Colorado | 27 | 81 | 84 | 40 | 44 | 3.0 | 30.0 | 67.0 |
| New Mexico | 2 | 12 | 3 | 1 | 2 | 1.0 | 34.0 | 65.0 |
| Utah | 2 | 6 | 9 | 3 | 6 | 7.0 | 59.0 | 34.0 |
| Mountain | 90 | 170 | 125 | 58 | 67 | 3.1 | 32.9 | 64.0 |
| Washington | 13 | 31 | 16 | 7 | 9 | 11.0 | 30.0 | 59.0 |
| Oregon | 40 | 47 | 40 | 20 | 20 | 5.0 | 28.0 | 67.0 |
| California | 9 | 11 | 15 | 9 | 6 | 5.0 | 6.0 | 89.0 |
| Pacific | 62 | 89 | 71 | 36 | 35 | 6.5 | 24.7 | 68.8 |
| United States | 3,930 | 3,482 | 2,096 | 798 | 1,298 | 10.8 | 36.5 | 52.7 |

1/ Reports relative to the utilization of recoverable straw were received from crop correspondents in Wisconsin, Minnesota, North Dakota, South Dakota, and Nebraska. Estimates in other areas based largely on utilization of straw of other small grains for which reports were received.

2/ Includes all straw left as stubble, and chaff and straw too short to recover by raking fields where grain was combined.

3/ Includes chaff from grain threshed with stationary threshers.

Flaxseed Straw

Along with the decided wartime increase in production of flaxseed there was a corresponding increase in flax straw. The estimated total production of flaxseed straw in 1945 was more than three times the 1935-39 average but was slightly below the 1940-44 average (table 16). Of the total flaxseed straw approximately 60 percent in 1945 was estimated as recoverable. Of this, somewhat more than 40 percent was used on farms or sold as baled or loose straw.

Flaxseed straw came into extensive use during the war in making cigarette paper and other high-quality paper. Trade sources indicate that around 360,000 tons were bought for industrial uses in 1945. Reports from crop correspondents' show that about 340,000 tons were sold or used as baled straw, but some loose straw is bought from farmers and baled before shipment. The baling of straw was mostly confined to Minnesota, South Dakota, Iowa, and California, where practically all of the flax straw for industrial uses was bought.

In all important flaxseed States except Minnesota most of the flaxseed straw was left in fields or was not otherwise used.

Table 16.- Estimated production and utilization of flaxseed straw 1/

| State | Estimated yearly straw production in 1945 | | | Percentage of recoverable straw in 1945 | | | Left in field or otherwise used | | |
|------------------|---|------------|------------|---|------------|---------|---------------------------------|---------|---------|
| | 1,000 tons | 1,000 tons | 1,000 tons | 1,000 tons | 1,000 tons | Percent | Percent | Percent | Percent |
| Iowa | 26 | 238 | 79 | 33 | 46 | 17 | 25 | 58 | |
| Minnesota | 519 | 1,164 | 986 | 304 | 682 | 36 | 35 | 29 | |
| North Dakota | 178 | 672 | 1,025 | 456 | 569 | 3 | 14 | 83 | |
| South Dakota | 53 | 257 | 389 | 145 | 244 | 19 | 17 | 64 | |
| Kansas | 33 | 114 | 56 | 30 | 26 | 1 | 7 | 92 | |
| Texas | 3 | 17 | 42 | 24 | 18 | - | 2 | 98 | |
| Montana | 14 | 167 | 110 | 58 | 52 | - | 9 | 91 | |
| Arizona | 2 | 32 | 33 | 19 | 14 | - | - | 100 | |
| California | 71 | 287 | 161 | 89 | 72 | 26 | 1 | 73 | |
| All other States | 25 | 64 | 22 | 8 | 14 | 9 | 46 | 45 | |
| United States | 924 | 3,012 | 2,903 | 1,166 | 1,737 | 19.4 | 22.2 | 58.4 | |

1/ Does not include flax for fiber.

2/ Includes all straw left as stubble, and chaff and straw too short to recover by raking fields in which grain was combined.

3/ Includes chaff from grain threshed with stationary threshers.

Buckwheat Straw

Production of buckwheat has been declining for many years and in 1945 the total of the buckwheat straw was estimated at 266,000 tons. About 68 percent of the total output of straw was estimated as recoverable (table 17). About 55 percent of this was utilized on farms or sold. Buckwheat is grown principally in hilly areas and less than 1 percent of the recoverable straw was used or sold as baled straw.

Table 17.- Estimated production and utilization of buckwheat straw

| | Estimated yearly average buckwheat- straw production <u>if cut at ground level</u> | | Straw production in 1945 <u>that was:</u> | | Percentage of recoverable straw in 1945 that was: 1/ | | | |
|------------------|---|-----------------|---|-----------------|--|--|--|------|
| State | : 1,000 tons | : 1,000 tons | : 1,000 tons | : 1,000 tons | : Used on farm or farm or sold as baled | : Left in field as: stubble, chaff and: short straw from combines 2/ 3/ | : Left in field or farm wise not used straw | |
| New York | 90 | 100 | 61 | 22 | 39 | .8 | 50.0 | 49.2 |
| Pennsylvania | 95 | 96 | 81 | 25 | 56 | .5 | 65.0 | 34.5 |
| All other | | | | | | | | |
| Northeast | | | | | | | | |
| States | 12 | 10 | 11 | 3 | 8 | .3 | 74.5 | 25.2 |
| Northeast | 197 | 206 | 153 | 50 | 103 | .6 | 60.0 | 39.4 |
| Michigan | 14 | 19 | 14 | 6 | 8 | .2 | 25.0 | 74.8 |
| Wisconsin | 6 | 10 | 12 | 3 | 9 | .2 | 65.0 | 34.8 |
| Minnesota | 7 | 19 | 25 | 6 | 19 | .1 | 60.0 | 39.9 |
| Lake States | 27 | 48 | 51 | 15 | 36 | .1 | 53.5 | 46.4 |
| Corn Belt | 25 | 21 | 36 | 14 | 22 | .5 | 32.5 | 67.0 |
| Great Plains | 4 | 3 | 6 | 2 | 4 | - | 18.0 | 82.0 |
| Appalachian | 15 | 11 | 14 | 3 | 11 | .3 | 64.0 | 35.7 |
| Southeast | 8 | 8 | 6 | 1 | 5 | .2 | 60.0 | 39.8 |
| United States | 274 | 297 | 266 | 85 | 181 | .4 | 54.7 | 44.9 |

1/ Reports received from crop correspondents in New York and Michigan.

Estimates in other areas based largely on harvest practices for other small grains for which reports were received.

2/ Includes all straw left as stubble, and chaff and straw too short to recover by raking fields where grain was combined.

3/ Includes chaff from grain threshed with stationary threshers.

Rice Straw

Estimated production of rice straw in 1945 was somewhat above average but amounted to less than 2 percent of the total small-grain straw. Of the 2.3 million tons of rice straw produced, it was estimated that more than 60 percent was recoverable. Of this about 56 percent was left in the fields or was not otherwise used. Baling rice straw is not done generally--about 2.4 percent of the recoverable straw was baled (table 18).

In the eastern rice areas after the rice is harvested, the fields are often pastured; cattle graze the stubble and have access to the straw stacks. In these States, 40 percent or more of the rice straw was used, or was sold as loose straw, principally for feeding cattle.

The reports indicate that practically all of the recoverable rice straw in California was left in the fields or was otherwise not utilized.

Table 18.- Estimated production and utilization of rice straw

| State | Estimated yearly rice straw production if cut at ground level | | | Straw production in 1945 | | Percentage of recoverable straw in 1945 that was: | | |
|--|--|-------|----------|--------------------------------|-------|---|------|--------|
| | | | | Left in: | | Left | | |
| | | | field | Recover- | Used | on | in | |
| | | | stubble, | as for | on | farm | or | |
| | | | chaff | use on | farm | farm | or | other- |
| :1935-39:1940-44: 1945 | | | and | farm | or | sold | wise | |
| | | | short | or | sold | as | not | |
| | | | straw | for | baled | loose | used | |
| | | | from | sale | | straw | | |
| | | | combines | 2/ | | | | |
| | | | 1/ | : | | | | |
| | | 1,000 | 1,000 | 1,000 | 1,000 | 1,000 | Per- | Per- |
| | | tons | tons | tons | tons | tons | cent | cent |
| | | : | : | : | : | : | : | : |
| Arkansas | 295 | 403 | 446 | 106 | 340 | 1 | 47 | 52 |
| Louisiana | 684 | 713 | 778 | 223 | 555 | 4 | 57 | 39 |
| Texas | 414 | 528 | 609 | 261 | 548 | 2 | 35 | 63 |
| California | 292 | 406 | 470 | 259 | 211 | 1 | 2 | 97 |
| | | : | : | : | : | : | : | : |
| United States | 1,685 | 2,050 | 2,305 | 849 | 1,454 | 2.4 | 41.4 | 56.2 |
| | | : | : | : | : | : | : | : |
| 1/ Includes all straw left as stubble, and chaff and straw too short to recover by raking fields where grain was combined. | | | | | | | | |
| 2/ Includes chaff from grain threshed with stationary threshers. | | | | | | | | |

1/ Includes all straw left as stubble, and chaff and straw too short to recover by raking fields where grain was combined.

2/ Includes chaff from grain threshed with stationary threshers.

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